THE GAS JOURNAL

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A Glance at the Contents—

New Gasholder at Skegness.

A new spiral-guided gasholder of 1 million c.ft. capacity has just been completed for the Skegness Gas Department by Messrs. Samuel Cutler & Sons, Ltd. [p. 299.]

Gas Supply in Jersey.

A special correspondent describes a visit to the works of the Jersey Gas Light Company, Ltd., which produces round about 283 million c.ft. of gas per annum. [p. 295.]

Copper Service Pipes.

The Research and Engineering Department of Mueller, Ltd., of Sarnia, Ontario, presented a paper on this subject at the 25th Annual Convention of the Canadian Gas Association held in June last. [p. 302.]

Two-Part Tariff at Burnley.

The Burnley Gas Department has introduced an optional two-part tariff for ordinary consumers, following the success of the four-part industrial tariff which has been in operation for two-and-a-half years. [p. 294.]

An Up-to-Date Garage Lighting Installation.

It has again been decided to utilize gas as the lighting agent in the recent extension to the Ecclesbourne Garage, High Road, Palmers Green, the total number of lamps installed in the whole of the new premises being twenty-eight 1000-c.p. units. [p. 298.]

New Continental Coking and Bye-Product Plant.

Described to-day is the new coking and bye-product plant of the Imperial Continental Gas Association at Pont Brûlé, which was erected by Gas Chambers and Coke Ovens, Ltd., of London, who are the sole licensees for the Collin type of plant. [p. 300.]

Gas in Ford Motor Company's Works.

Ultra-modern in every respect the assembly plant of the Ford Motor Company, recently erected in Long Beach, California, stands as a model for efficiency in equipment and layout in both the assembly and finishing divisions. Gas is used to a large extent. [p. 296.]

Forthcoming Engagements

Aug. 16 and 17.—IRISH ASSOCIATION.—Meeting in Dublin.

Sept. 1.—ASSOCIATION OF STATUTORY METER INSPECTORS.—Annual Meeting in Edinburgh.

Sept. 8.—NORTH BRITISH ASSOCIATION OF GAS MANAGERS.—Annual Meeting in Ayr.

Sept. 13.—INSTITUTION OF GAS ENGINEERS.—Meetings of Finance Sub-Committee, 10 a.m.; Finance Committee, 10.30 a.m.; Executive Committee, 11 a.m.; Gas Education Executive Committee, 4 p.m., 28, Grosvenor Gardens, S.W. 1.

Sept. 13.—NATIONAL GAS COUNCIL.—Meeting of Central Executive Board. There will be no meeting of the Board or of the Central Committee of the Federation of Gas Employers during August.

Sept. 13.—B.C.G.A.—Meeting of the General Committee at 4 o'clock approximately, 28, Grosvenor Gardens, S.W. 1.

Sept. 14.—INSTITUTION OF GAS ENGINEERS.—Meetings of Purifiers Sub-Committee, 10.15 a.m.; Gasholders Sub-Committee, 2.30 p.m., 28, Grosvenor Gardens, S.W. 1.

Sept. 15.—S.B.G.I.—Meeting of Council in the afternoon.

Sept. 19.—INSTITUTION OF GAS ENGINEERS.—Meetings of Calorimeters Sub-Committee, 2.30 p.m.; Sir Arthur Duckham Memorial Fund Exploratory Committee, 4.30 p.m., 28, Grosvenor Gardens, S.W. 1.

Sept. 20.—INSTITUTION OF GAS ENGINEERS.—Meetings of Joint Research Committee, 10 a.m.; Liquor Effluents and Ammonia Sub-Committee, 2.30 p.m., 28, Grosvenor Gardens, S.W. 1.

Sept. 21.—INSTITUTION OF GAS ENGINEERS.—Meetings of Meters Committee, 10.15 a.m.; Tar Sub-Committee, 12 noon; Committee on the Admittance of Chemists to Corporate Membership, 2.30 p.m., 28, Grosvenor Gardens, S.W.1.

Sept. 22.—WALES AND MONMOUTHSHIRE ASSOCIATION.—Meeting at Portheawl.

Sept. 26 to 28.—B.C.G.A.—Annual Conference at Leeds.

Sept. 30.—INSTITUTION OF GAS ENGINEERS.—Meeting of General Research Committee, 2.30 p.m., 28, Grosvenor Gardens, S.W. 1.

Oct. 4.—INSTITUTION OF GAS ENGINEERS.—Meeting of Sir Arthur Duckham Memorial Fund Committee, 3 p.m., 28, Grosvenor Gardens, S.W. 1.

Oct. 7.—NORTH OF ENGLAND ASSOCIATION.—Autumn Meeting.

Oct. 10.—INSTITUTION OF GAS ENGINEERS.—Meetings of Finance Sub-Committee, 2 p.m.; Finance Committee, 2.30 p.m.; Executive Committee, 3 p.m.; Benevolent Fund Committee of Management, 4.30 p.m., 28, Grosvenor Gardens, S.W. 1.

Oct. 11.—INSTITUTION OF GAS ENGINEERS.—Meetings of Council, 10 a.m.; Board of Examiners, 12.15 p.m.; Gas Education Committee, 4 p.m., 28, Grosvenor Gardens, S.W. 1.

Oct. 13.—INSTITUTION OF GAS ENGINEERS.—Meetings of Joint Lighting Committee, 11 a.m.; Gas Appliances Sub-Committee, 2.30 p.m., 28, Grosvenor Gardens, S.W. 1.

Oct. 20.—INSTITUTION OF GAS ENGINEERS.—Meetings of Refractory Materials Joint Sub-Committee, 11 a.m.; Pipes Sub-Committee, 2.30 p.m., 28, Grosvenor Gardens, S.W. 1.

EDITORIAL NOTES

Rewarding the Paying Consumer

Two years ago the Burnley Gas Department introduced an optional four-part system of charge for gas used for industrial purposes. The system, inaugurated in an endeavour to reward remunerative consumers, was offered to any trade or industrial consumer who considered such a scale would be advantageous in view of either the present or the future. The method of charge was composed of a customer charge, a manufacturing demand charge, a distribution demand charge, and a commodity charge; and it has met with extraordinary success. As a result of its adoption new business has already been gained by the Department to the extent of 70 million c.ft. a year; and the scheme has now been broadened to include all " commercial " consumers, for a two-part system was not considered wide enough in its application to premises occupied by large business organizations such as banks, public authorities, and building societies. The latest effort is the introduction of a two-part optional tariff applicable to all ordinary consumers, particulars of which scheme are set out in the " JOURNAL " to-day.

We think Burnley's enterprise is what is needed to increase gas sales and to render the charges to consumers more equitable. The Department's policy is to discontinue a general all-round reduction in the price of gas, so that benefits may be given to those consumers who provide the profits. The system is simple enough—a fixed inclusive charge based on the number of rooms in which gas can be used on any one premises, with a minimum charge, and then a low commodity charge. At the moment no attempt is being made to deal with prepayment consumers in this manner, but the Burnley Gas Department are already providing prepayment users with means for obtaining gas at cheaper rates based on the consumption—rates which have real practical significance as distinct from mere paper value. Also encouragement is given to prepayment consumers to purchase fittings and appliances " through meter " by a reduction in the quantity of gas supplied per penny. Any appliance having a selling price of not more than £10 can be purchased in this way, so that the latest cookers, fires, and water heaters are available to all. A " cottage set " scheme introduced two and a half years ago (a " cottage set " consists of a pendant lighting set, bowl, switch, and iron, paid for via the meter) has met with a warm welcome, a matter of £1800 having been collected in this way during the last financial year. Burnley's recent progress provides a good example of the results which reward enterprise.

Lighting of Scarborough Spa

THERE will be still in the recollection of readers the magnificent photographs of the lighting of Scarborough Spa which accompanied a paper on the " Lighting of Seaside Resorts " presented to the International Illumination Congress last year, of which Mr. A. P. Allan, the Engineer and General Manager of the Scarborough Gas Company, was part author. Two photographs of the gas lighted Italian Terrace were reproduced in the " JOURNAL," by which means some idea was afforded of the excellence of the results attained. This lighting is a source of legitimate pride to the Gas Engineer who is responsible for it, as well as to the Gas Industry at large. So satisfactory has it been, indeed, that early this season, when the Spa Company extended the parking space for cars, the improved lighting was carried out with gas, by the aid of Sugg 1200-c.p. lamps.

Through an unfortunate misapprehension, the facts of the case—which, as we have shown, are that the gas lighting on the Spa continues to give complete satisfaction—have been somewhat obscured by a writer in an electrical contemporary, who, perceiving through rose-coloured glasses that the "change-over to electric lighting is gathering force all over the country," proceeds to point out that " even the Scarborough Spa lighting, which was the proudest feather in the gasmen's cap at the International Illumination Congress last year, is being converted." That is not so. The actual circumstances, as we understand them, are that the Corporation are installing electric light in the main street and on the South Foreshore. This will displace about 118 12-light lamps. These gas lamps, however, are to be refixed in other streets in place of 6-lights, which, in turn, will replace 4-lights, and 4-lights will replace 2-lights. Thus the resultant loss to gas will be only 118 2-light lamps.

So far as we can gather, the Corporation have nothing but praise for the public gas lighting in Scarborough, and have been very satisfied with the treatment they have received from the Gas Company. No doubt, however, they felt, as owners of the Electricity Undertaking, that this Department should have a share in the lighting of the town.

The Future

" I AM afraid we have all been too prone to think of progress in our factories as being tied up only with power; and if a certain factory was up to the minute in the use of power, that has generally been considered to be the last word. . . . I do not think it is generally realized that in many factories and mills the use of heat, measured in B.Th.U., is many times the use of power when measured in the same terms. Therefore any attention paid to improving heating processes has a likelihood of returning a greater money value than the same amount of attention paid to power." This quotation is from an address by Mr. E. D. Milener, of the American Gas Association, at a recent conference on industrial process heating held in Cleveland, Ohio. Since the war there has been a distinct trend towards supplying energy in the form of both heat and power from central sources; and in regard to town gas, the industrial use of this refined fuel has grown apace during the past five years in this country. The popularity of town gas has enjoyed a similar, though perhaps greater, increase in popularity in the United States in the same period; and all facts support Mr. Milener's contention that to say that industrial gas sales will not continue to develop with equal or greater intensity is to say that our whole industrial system is ready to throw off much of the progress it has made.

There is evidence that faith in the industrial gas load and keen practical interest in research calculated to widen the field are fully justified. It is safe to say that in Great Britain, as well as in the United States, more activity than ever before is to be found within industrial sales organizations and industrial research laboratories. It has always been the policy of the " JOURNAL " to keep its readers well informed of progress in other countries, and hardly a week passes now without reference to some new process or some modification in existing procedure which is strengthening the gas business. To one or two of these developments which are being so

efficiently sponsored by the American Gas Association Mr. Milener refers. There is, for example, the application of direct gas firing to high-grade tableware in continuous kilns. Already one of America's leading makers of such ware is adopting this method as one of the chief steps in plans radically to reduce the selling price of its products. Again, great strides have been made towards baking cores in automatic convected heat gas ovens, especially in the motor-car industry; and in this regard the author can see " cores being baked in the future in convected heat gas ovens much in the same way that bread is being baked now even in some of the small bakeries. Then " within the last two years gas forging equipment has been brought out that heats billets practically scale free, under the most severe operating conditions. I hesitate to predict the extent to which the heat treating and forging industries will be affected when they once begin to demand that all steel should come out of the furnaces scale free. Gas has pioneered the way in this great movement and will be the backbone of its extension throughout industry." And there are diffusion flame combustion, and air conditioning, and a host of other new developments. Granted faith and energy, there is, indeed, no room for pessimism. Part of this energy must be expended in keeping in touch with the Gas Industry's progress in other parts of the world, in which the " JOURNAL " can be of real service; and we are very glad to note a further indication, as will be seen in later columns, of the growing co-operation between the Institution of Gas Engineers and the American Gas Association. We refer to the latter body's extension of membership advantages in regard to the purchase of books on the use of gas in industry published by the Association.

Modern Coking Plant

WE give in this issue of the " JOURNAL " an account of a new installation of coking and bye-product plant at the Pont Brûlé Works of the Imperial Continental Gas Association. This coking plant is the second to be installed, the first being a Simon-Carves plant in two batteries have a total throughput of 1000 tons of coal a day. With the plant under review, which is of the Collin type, the carbonizing capacity of the works has been increased to 2300 tons a day—the second step in a broadly-planned scheme of centralization of gas manufacture to supply a grid serving Antwerp, Brussels, and the surrounding country. Regarding this scheme, while the manufacture of gas was the first objective of the Association, consideration was given to the fact that there existed in Belgium a large market for metallurgical coke; hence the adoption of coke ovens as the carbonizing unit.

The contract for the new Collin installation—comprising coke ovens, bye-product plant, benzole rectification plant, extensions to the coal storage and coal and coke handling equipment, and coal crushing and blending plant, together with all auxiliaries—was placed with Gas Chambers and Coke Ovens, Ltd., a couple of years ago; and bearing in mind the circumstances, it certainly speaks well for the enterprise of this British firm that they actually completed the installation in twelve months. And this in spite of the fact that the work was carried out in a foreign country on ground which was bad and necessitated the driving of 1350 60-ton concrete piles for the foundations. An achievement of merit.

Details of the installation, for which we are indebted to the " Iron and Coal Trades Review," are set out in the article on later pages. An interesting feature of the coke oven plant is the simple arrangement of gas and air supply pipes for heating the setting. Any number of ovens or sets of ovens may be heated with producer gas, coke oven gas, or a mixture of the two, and varied from day to day to meet requirements. Changes over can be effected in a few minutes while the plant is in operation, an ingenious device being fitted on the rich-gas supply pipe to each flue, which prevents the formation of graphite in the burners. The layout of the bye-product plant allows ready accessibility to all the units, and the buildings themselves are liberally proportioned, well lighted, and well finished. Sulphate of ammonia is recovered by the indirect process, the whole of the make being dealt with in a single saturator; and the benzole plant, which has a capacity of 15 tons of crude benzole per day, is complete with an acid regenerating plant which obviates obnoxious residues. The system of recording and measuring instruments, made as simple as possible by grouping, is also worthy of note.

Nationalization

MANY and many a time have we heard the cry of " Nationalization ! " On some occasions the Coal Mining Industry, and on others the Railways, formed the objective. Mainly in more prosperous days has the cry been heard in the land. Perhaps now colliery proprietors and railway shareholders might be more easily reconciled to a change of ownership than would have been the case of yore. Disadvantages of nationalization have, however, been both argued and, in other branches, proved—one of the principal being the resultant sterilization of enterprise. But the idea is still hugged to many breasts, and now it has broken out in a less familiar direction. The Executive Committee of the Labour Party would, it seems from a report lately issued, like to have set up a National Electricity Board (in place of the Electricity Commissioners and the Central Electricity Board), to which would be transferred all authorized electricity supply undertakings, the national grid, railway and traction generation, and certain non-statutory undertakings.

It is felt by the Labour Party that, " while substantial progress is being made with co-ordinated generation, the distributive side of the industry is in a very much less satisfactory condition. About one-half the charge to consumers represents distribution costs; but while authorized distributors will be able to obtain from the national grid electricity in bulk at a low price, distribution costs will not be directly affected. There are very big variations in the prices charged to consumers in different areas, and in distribution costs. Nothing else could be expected from a system of distribution which is broken up between over 600 separate undertakings. On the technical side, the multiplicity of ownership has similar results." The report proceeds: " The failure of the distributive system is even greater in service and sales. A recent inquiry by the Electricity Commissioners has shown in some detail how consumption is being handicapped by many of the unsatisfactory methods of electricity charges and tariffs now adopted; while another inquiry has revealed the failure of hundreds of undertakings to provide adequate facilities for wiring and the installation of electrical apparatus." There is, the Executive Committee of the Labour Party feel, no likelihood of any substantial change in the position so long as multiple ownership continues. " Generation is being dealt with on a national scale, but distribution is local and diversified, and inefficient as a whole. The unification of ownership would greatly contribute to the success of nationally planned generation, and this alone would justify unification. But for distribution, which obviously must also be planned on a national scale, unification is absolutely urgent and vital."

For the time being the report possibly will be regarded merely as an expression of opinion. But of how many things which have since come to pass could not the same have been said with perfect truth only a few years ago !

CORRESPONDENCE

Holding-Down Bolts of Disc-Type Gasholders

SIR,—I shall soon show that Mr. Milbourne has failed to prove his case against my article of the above title; therefore I think the opening remarks of his letter of the 28th ult. to be quite uncalled for. Incidentally, I may also remind him that we are not discussing spirally-guided gasholders at the moment, although I fancy I can take care of myself regarding them, especially as I was the first individual in the world to whom the inventor (my father) divulged the idea, and I have been constantly in touch with the development of the same since that time (1887). If Mr. Milbourne will kindly again read my letter of July 23 last, he will see that the formula to which I took exception was his own, or that sponsored by him. It could not logically be otherwise.

I have scanned his array of useless equations, and find the fatal spot to be at No. 2.

Here he has really assumed, for example, that $\frac{b}{m} = \frac{a}{R}$, where b is only one of the dual forces, thus giving a an arbitrary value.

The 4 should *not* be dissociated from b, and the ratios *should* be equated on this supposition, throughout. In other words, it is not true that the imaginary triangle, two of which sides represent b and m, is a similar triangle to the one parallel to it, and having two of its sides representing a and R. When isolated parallel forces or resistances are concerned, as in the present instance, it is only when those parallel resistances lie in the *same* plane that the method of "similars" can be used.

Cannot Mr. S. M. Milbourne see that in getting my own formula I only needed to use *resultant* resistances, situated in the same plane, and that if the *resultant moments* balance a given tilting moment, then it does not matter how the components of the resultant resistances are distributed about a horizontal plane in the case concerned, provided the corrected number of terms to suit are accounted for?

It thus appears, after all the fuss that has been made, that Mr. Milbourne's vaunted formula is not only inapplicable to the present purpose, but is absolutely meaningless.

Yours, &c.,
A. GADD.

62, *Barton Arcade*,
Manchester,
Aug. 5, 1932.

Storage of Coal

SIR,—The contributed article on the "Storage of Coal" published in the "JOURNAL" for July 27 was very interesting and instructive.

We have some 9000 tons of coal in stock, consisting of screened coal and nuts, chiefly the latter. This is stacked in bays, each bay containing 150 to 160 tons, the bays forming an overhead railway to the retort houses (verticals). The average height is 14 ft. The coal has been in stock since the last coal strike, fresh coal being used daily. The reason for this, I think, will be appreciated—viz., cost of taking out of stock. The value of the stock coal has been reduced year by year to the figure of 7s. 6d. per ton. I am about to try the experiment of emptying one bay from stock and replacing with fresh coal and thus finding the cost per ton. If, say, one-third of the stock could be removed each year, so that no portion of the coal is more than three years old, would it not be better practice than allowing it to remain in stock until a coal or railway strike comes along, by which time, even at 5s. per ton *plus* cost of handling, it becomes a dear coal, owing to poor results, "sticking charges," &c.? The capital cost of suitable machinery for dealing with the stock coal would in my case be very heavy. The best I can do at present is to use a travelling crane and grab as much as possible into wagons and mix with the daily deliveries of fresh coal. I raise the above points in the hope that expressions of opinion will be forthcoming. Many engineers no doubt allow their coal to remain in stock until it is almost useless from a gas-making point of view, unless the works are large enough to warrant suitable handling plant.

Yours, &c.,
"STOCK COAL."

Aug. 8, 1932.

PERSONAL

RETIREMENT OF MR. S. O. STEPHENSON.

In the Co-Partnership Magazine of the Brighton, Hove, and Worthing Gas Company, "C. H. R." writes as follows concerning the retirement of Mr. S. O. Stephenson, the late Engineer and General Manager of the Worthing Gas Company:

When the two Companies [*i.e.*, the Brighton and Hove and the Worthing] were united in July, 1931, the services of Mr. Stephenson were retained for a period of nine months, and very valuable they proved during the transition stage, and the final closing down of the works at the end of March last. His intimate knowledge of the activities of the Worthing Company was of inestimable service to the management, and we all parted with him with regret that with the amalgamation of the two Companies his office was no longer necessary.

Mr. Stephenson's urbane and genial nature endears him to all who have the pleasure of his acquaintance and friendship, and we all hope he will continue in our locality indefinitely in his new activities.

The following is a very brief account of Mr. Stephenson's professional career, and it will be seen that he has had a very great variety of engineering experience. He is of Scottish extraction and was apprenticed 41 years ago to the Norwich Works of the British Gas Light Company, under the late Mr. F. E. Linging. After completion of his articles, he became Engineering Assistant to the late Mr. Wm. North at the Stourbridge Gas-Works, and with him carried out a good deal of important constructional work, including the building in 1897 of a new Works for the Barking Gas Company (now absorbed by the Gas Light and Coke Company), for which Mr. North was Consulting Engineer.

He was then for a short time Assistant Manager at the Longton Gas-Works, and in 1899 was appointed Assistant Gas Engineer to the West Bromwich Corporation.

In June, 1901, he was appointed Gas Engineer and Manager to the Tipton (Staffs) Council, a position he held for thirteen years, during which time he undertook the reconstruction of the works and overhauled and improved the distribution system. He brought the Undertaking from a losing concern to a high state of prosperity.

He was appointed Engineer and General Manager to the Worthing Gas Light and Coke Company in 1914, commencing duties in October of that year; and the Company's business more than doubled during his seventeen years' service.

His favourite motto is: "Anything that is worth doing is worth doing well; if not worth doing well, then not worth doing at all." And this slogan has been the guiding influence throughout his career.

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Mr. RICHARD LALLY, of Brierley Hill, Staffs., has been appointed Manager of the Braintree Gas-Works, Essex.

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Lieut.-Col. J. D. K. RESTLER, O.B.E., M.Inst.C.E., M.I.Mech.E., M.I.E.E., M.Cons.E., has accepted the Presidency of the Institution of Engineers-in-Charge for the session 1932-33.

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Mr. J. SHIELD, who has resigned from the position of Manager of Barnard Castle Gas-Works, has been presented by Mr. T. Rutter, on behalf of the officials and staff, with a wallet and propelling pencil.

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Mr. E. H. SINGLETON, Solicitor, of Blackpool, has joined the Directorate of the Fleetwood Gas Company. His father, Mr. Hugh Singleton, a Director of the Company for several years, is now Vice-Chairman.

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Mr. BARRINGTON FANCY, Assistant Works Manager to the City of Chichester Gas Company, on leaving to take up the position of Technical Assistant to the Basingstoke Gas Com-

pany, was the recipient of a handsome oak Westminster Chiming Clock.

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Alderman THOMAS MITCHELL, M.B.E., J.P., Vice-Chairman of the Stoke-on-Trent Gas Committee, is the prospective Lord Mayor of Stoke-on-Trent for the next municipal year. Alderman Mitchell was recently appointed Chairman of the Midland District Executive Board of the National Gas Council and representative on the Central Executive Board.

* * *

Mr. WILLIAM TAYLOR KITCHING, Managing Director of Messrs. John Fowler, Ltd., of Sheffield, has been appointed General Manager of the Ironworks Department of Messrs. Newton Chambers & Co., Ltd., Thorncliffe, near Sheffield. Mr. Kitching was educated at Oundle, served his engineering apprenticeship with the Horsehay Company, has had a wide experience in engineering, and, after four years with the Royal Engineers in the war, left the Services as a Major.

OBITUARY

The death is announced at Uttoxeter of Mr. WILLIAM MURRAY, aged 80, who eight years ago retired after having been Manager of the Uttoxeter Gas-Works for 35 years. For 33 years prior to taking over the managership, Mr. Murray was at the gas-works under the direction of his father, who was then the Manager.

* * *

Mr. JOHN GUNNING, a pioneer of automatic street lighting, and the inventor and patentee of the "Gunfire" controllers and time switches, died at his residence, 18, Christchurch Road, Bournemouth, on Aug. 4. He was aged 74 years. He was Managing Director and Secretary of the British, Foreign, and Colonial Automatic Light Controlling Company, Ltd.

THE NEWS OF THE WEEK

A Gas Price Reduction is announced by the Wimborne Minster Gas Company, Ltd., from 9·6d. to 9·2d. per therm, equivalent to 3s. 10d. per 1000 c.ft., as from the June readings of the meters.

The Scottish Ideal Home Exhibition will be open at Kelvin Hall, Glasgow, from Oct. 5-29, from 11 a.m. to 10 p.m. daily. Scottish firms desirous of exhibiting should communicate with the Manager, Scottish Ideal Home Exhibition, Kelvin Hall, Glasgow.

The Price of Gas at Saltcoats has been reduced by 2½d. per 1000 c.ft. At Dunblane it is to be reduced by 5d. per 1000 as from the September survey; and at Hawick the price has been reduced by 4d. to 3s. 8d. All three undertakings are owned by private companies.

Croydon Gas Company's Dividend.—The Directors, at their meeting on July 29, resolved to pay dividends in respect of the half-year ended June 30, 1932, at the following rates per cent. per annum: Sliding-scale stock, 7; maximum dividend, 5; redeemable preference, 7½.

Gas-Works as a Health Resort.—The death has taken place at Dundee of Mr. William Lawson (popularly known as "Father" Lawson), foreman in the purifying department of the Dundee Corporation Gas-Works, at the age of 83. He had fully sixty years' service in the Gas Industry.

Portsmouth Gas Company.—The Directors of this Company have recommended, on account of the year ended Dec. 31, 1932, the payment of an interim dividend on Sept. 1 next, at the rate of 5 p.ct. per annum on the 5 p.ct. maximum stock, and of 8 p.ct. per annum on the consolidated stock, less income-tax.

Price Reduction at Runcorn.—Mr. J. M. Frith, who presided at the meeting of the Runcorn Gas Company, after announcing the usual dividends, intimated that after the end of the current quarter the price of gas would be reduced by 1d. per therm. There would also be a reduction of 3d. per 1000 c.ft. to slot meter consumers.

New Holder at Edinburgh.—The Public Utilities Committee of Edinburgh Corporation have decided to erect a new spiral-guided gasholder at Holyrood Road, and tenders have been invited for the work, which, it is hoped, will be completed in six months. It will have a capacity of 1 million c.ft., and will replace one which has been in use for over sixty years.

To Stimulate the Use of Gas for heating and general purposes, the Directors of the Shrewsbury Gas Light Company have adopted a revised scale of discounts to come into operation as from the current quarter—5 p.ct. on 5000 c.ft. quarterly consumption; 7½ p.ct. on 15,000 c.ft.; 10 p.ct. on 30,000 c.ft.; and 12½ p.ct. on 50,000 c.ft. Special prices are quoted for larger users.

Royal Sanitary Institute.—The Autumn Session of training courses for examinations for sanitary inspectors, smoke inspectors, Associateship (general hygiene and sanitation), and in sanitary science will commence on Monday, Sept. 19. Syllabuses of the lectures and of the examinations, containing full particulars, are obtainable from the Secretary of the Institute, 90, Buckingham Palace Road, London, S.W. 1.

North of England Gas Managers' Association.—The autumn meeting, under the Presidency of Mr. A. C. Hovey, of London, will take place at the Blackhall Colliery of the Horden Collieries, Ltd. The meeting will be held at 11 a.m. on Friday, Oct. 7; and in the afternoon the dry and wet coal cleaning and powdered fuel plants will be inspected, and also the underground workings and latest forms of coal cutting, conveying, &c.

Pinner's Pylons.—From the "Evening Standard:" Pinner, who protested against the line of electricity pylons across their territory, have now a fresh grievance, for the Central Electricity Board have decided to dismantle that in the recently acquired Pinner Park and erect in its place a new "tower" 15 ft. higher and correspondingly larger at the base. Hendon Rural Council record their regret "that they are powerless to prevent these hideous structures."

New B.I.F. Poster.—Britannia is shown as an Amazon in the new British Industries Fair poster by Mr. Tom Purvis, 70,000 copies of which are in process of being printed for display throughout the civilized world. The poster shows Britannia with upraised forearm silhouetted in white against a deep blue background with "B. I. F., 1933," in solid lettering of bright red. The Fair's opening date (Feb. 20) is being added in eight languages for the versions used abroad.

The New Gasholder at the Stafford Road works of the Wolverhampton Gas Company was brought into use on July 22, when the Chairman of the Company (Mr. A. B. Hanbury-Sparrow, J.P.) turned on the valve governing the inlet to the holder. The holder, which has been erected by Messrs. C. & W. Walker, Ltd., of Donnington, Shropshire, has four lifts, spirally guided, and has a capacity of 3 million c.ft., which is equal to the total capacity of the five other holders in use.

"West's Gas" Summer Number.—The contents of the July issue of "West's Gas"—the House Journal of the Social Society of West's Gas Improvement Company, Ltd., of Miles Platting—cover an interesting range of serious and semi-humorous topics contributed by their readers at home and abroad, and are illustrated by a number of excellent photographs. The articles come from the pens of a large number of writers, and the expressions of opinion on "West's Gas" are not merely flattering; they are critical, in the best sense, and constructive.

THE NEWS—*continued.*

A Victory for Gas Lighting.

The Hitchin Urban District Council, owners of the electricity Undertaking, have accepted the Hitchin and District Gas Company's offer for the supply of gas to some 400 street lamps, together with their upkeep and maintenance, lighting, extinguishing, &c., the contract period being five years.

Hitherto, the Gas Company have supplied gas to the lamps, which have been looked after by the Council themselves. The whole lighting installation is being modernized, burners of higher power being fitted, with clock controllers throughout.

Capital Expenditure on Electricity.

Sir Arnold B. Gridley, reviewing in "The Times" the conditions governing cheap electric supply, stressed a point which enthusiasts too frequently miss. Referring to the electrical industry, he said: "Few outside the industry realize how vitally important it is to keep capital expenditure as low as possible. About £1000 has to be spent to secure each £200 of gross annual receipts, out of which £100 must come to provide for interest and depreciation—*i.e.*, capital charges. The remaining £100 must cover all other costs, and of these coal is roughly a third. Capital charges and coal are therefore the essential items on which to economize. In few, if any, other industries do capital charges form so large a proportion of the total costs. This explains why 'two-part' tariffs are being more widely introduced and why the 'fixed-charge' component must be high enough to cover at least these capital charges."

The Lighting of Hexham.

At the request of the Directors, Mr. Herbert Lees, Managing Director and Secretary of the Hexham Gas Company, has issued a statement to the proprietors of the Company concerning the public lighting of the town, explaining in what circumstances the local Electric Supply Company have been granted a renewal of a contract for street lighting for eight months. "The Directors of this Company," states Mr. Lees, "ask for no special favour in regard to these matters, but they do think this Company has not had a fair hearing or as much consideration in the negotiations as has been given to the Electric Supply Company."

It appears that the Electric Supply Company asks for an increase in the cost of public lighting; and if their scheme is accepted "a promise is given that substantial reductions will be made in the charges to private consumers. Thus the Council is asked to allow the Electric Supply Company to increase its sales to private consumers at the expense of the rates of Hexham."

A Book to Read.

And not merely to enjoy, but to profit by. Walter King, Ltd., have published a book which should claim the attention of the Gas Industry; and in times of severe competition and industrial depression the publication is singularly opportune, for the contents are excellent, while the price of the book is within the reach of all. This book, which sells at 5s. 6d., is entitled the "Domestic Utilization of Gas," and is written by Norman S. Smith, Assistant Editor of the "GAS JOURNAL," and R. N. LeFevre, Research and Training Section, Gas Light and Coke Company, Watson House. It deals with the fundamental principles of the combustion of gas and the design and fitting of gas-using appliances, and though of universal application should be of particular assistance to the younger members of the Gas Industry.

The idea of the book can best be explained by the following quotation from the authors' preface: "The authors commenced this book with a belief and an aim. The belief is that a knowledge of the principles of gas utilization is a *sine quâ non* of effective salesmanship in the Gas Industry; the aim was to deal simply and logically with these principles. Quite definitely the result bears no relation to a catalogue of gas-using appliances, but it is hoped that, with this book as a first step, the reader will in some measure be fitted to interpret the mechanism of gaseous combustion, to differentiate between good and bad apparatus and good and bad installation, and to appreciate underlying reasons for modification in design."

There is a foreword to the volume by Sir Francis Goodenough, C.B.E., Executive Chairman of the British Commercial Gas Association, in which he states: "I am confident the Industry in general, and in particular the gas salesman who has at heart its progress as well as his own personal success, will give a hearty welcome to this book. The subject is complex, both chemically and physically, but every page reveals that the authors are peculiarly well fitted for the task of dealing with it. Originality of approach, facility of expression, and, above all, a sympathetic knowledge of the difficulties, have combined to produce a readable and logical story and, at the same time, a thoroughly accurate and dependable work."

A feature of "Domestic Utilization of Gas" is the manner in which the book is illustrated throughout by original, clear line drawings. The Chapter headings are as follows: Constitution and Properties of Town Gas; Physical Considerations; Pressure, Specific Gravity, Temperature Flow; Governors, Meters, and House Pipes; Gas Flames and Burners; Ventilation; Gas Appliances; General Considerations; Cooking; Water Heating; Space Heating; Refrigeration; Domestic Lighting.

The Wide View of Salesmanship.

Following-up the Editorial Note on p. 240 of last week's "JOURNAL," in which the subject of training for salesmanship was discussed, a quotation may be made from a recent issue of the "Financial Times:" The 500 delegates, representing 37 countries, who attended the highly successful fifth Triennial Congress of the International Society for Commercial Education, were greatly interested to learn of the various schools for training in retail distribution. Especially were they interested in the Edinburgh venture. Here the city Education Authority has adapted and largely rebuilt a fine building for the purposes of a school of salesmanship. When the Lord Provost of Edinburgh opened the school, he remarked that it was the first of its kind to be planned and erected solely for the purpose of housing specialized classes for the distributive trades. It accommodates classes for the young people from all the main groups of distributors in the City of Edinburgh, this class of worker being by far the most numerous. The building has many notable features. Classrooms adapted and fitted for grocers, butchers, drapers, and other trades are arranged. There is an arcade on the top floor which contains five large "shops" fitted with 25 windows of varying designs and dimensions, and calculated to give ample scope for training in the art of window display. The interiors are available for the teaching of practical salesmanship. On other floors there are rooms set apart for tea blending and tasting, coffee-roasting, florists' work, ticket writing, pictorial advertisement, and electrical goods. For the butchers, up-to-date machinery and apparatus for studying meat for refrigeration and for the preparation of cooked meats has been provided. This school is the only one of its type at present in Scotland, and it is hoped it will be copied in large centres in England.

Coal and the Gas Industry.

A series of articles is appearing weekly in the "Western Mail and South Wales News" which should do much to put the importance of the Gas Industry before the public in this part of the country, and give them a fuller realization of its vast importance in economic life.

The writing of the articles is indeed in capable hands, the first three or four of the series coming from the pen of Mr. H. D. Madden, M.Inst.C.E., Engineer and Manager of the Cardiff Gas Light and Coke Company, while the remainder are to be contributed by Mr. J. H. Canning, Engineer and Manager of the Newport (Mon.) Gas Company, both of whom have occupied the Presidential Chair of the Institution of Gas Engineers.

In the first article Mr. Madden deals with the delivery of the raw material to the Gas Industry—to the extent of nearly 20 million tons per annum—showing how the supply of coal to the gas-works carbonizing plant ensures regular working to those collieries which own gas coal seams, providing work for some 70,000 miners. For the same reason railway companies benefit from the daily stream of coal wagons into the works and the outgoing rail traffic in the shape of coke, tar, and other residual products.

Mr. Madden goes on to write of the early days of the Industry, when gas lighting was first invented and introduced on a practical scale by Murdoch, Winsor, and other pioneers about the year 1812. The novelty of the lighting and its practical success so aided the suppliers that the lighting service sold itself, and no serious thought was given to the residuals of coke, tar, and ammonia; in point of fact, the direct-fired furnaces at that period consumed

most of the coke produced, and what was left over was sold as a Cinderella fuel to the poor people in the district around the works.

The introduction of incandescent gas lighting, the development of the gas cooker, and the further utilization of gas as a fuel in the home for fires, water heating, &c., opened out a new coal problem.

The knowledge of the properties of tar under distillation had been discovered, and the product began to receive greater attention. Coke was also beginning to receive the attention it deserved, and research commenced on the formation of cokes from coals of differing characteristics. The working out of the cannel seams, the introduction of the incandescent burner, and the rapid development of gas as a domestic fuel opened out new problems, and the candle power standard for the gas became obsolete, its calorific value now becoming the predominant factor.

Mr. Madden concludes on the note of the suitability of Welsh coal for gas-making purposes.

Liverpool Gas Progress.

We learn from the Liverpool Gas Company's Co-Partnership Magazine that there are now more than 210,000 consumers on the books of the Company. The progress made by the Company is well shown by the following figures, which represent annual gas sales (in c.ft.):

1900 . . .	3535 million	1915 . . .	5694 million
1905 . . .	3703 ,,	1925 . . .	6798 ,,
1931	7431 million		

During 1931, 14,614 gas cookers and 3014 gas fires were fixed on simple hire. There are now more than 113,000 gas cookers, and over 23,000 gas fires, rented from the Company, in addition to many thousands of cookers and fires fitted by local builders or bought by consumers.

Many million cubic feet of Liverpool gas are used every year for industrial purposes, the trades concerned ranging from jewellery to shipbuilding. Enormous quantities of gas are used locally in the food and metal trades.

As showing the confidence of the investor in the stability of the Liverpool Gas Company, it may be stated that the price of the Company's ordinary stock at the date of going to press is 112 p.ct.

Books on Industrial Gas.

The American Gas Association, through the kindness of Major Alexander Forward, Managing Director, has presented to the Library of the Institution of Gas Engineers their Industrial Gas Series of Reference Books.

This series, which can be inspected in the Library of the Institution, comprises volumes on Combustion, House Heating, Water Heating, Steam Boilers, Food Products, and Bakeries, Hotels, and Restaurants.

They have been prepared by the Technical Experts employed in the Laboratories of the American Gas Association, under the supervision of various Committees of their Industrial Gas Section. The series is kept continuously up to date by periodical revisions and new editions.

The most recent revision is the Third Edition of Combustion, in the preface of which is found the object of the series—namely, "not to claim for gas an undisputed superiority for every heating process, but to show the steps whereby efficient and economical installations can be engineered."

"Combustion" contains twelve chapters on Heat and its Measurement, Gas Volume and Pressure, Chemistry of Combustion, Thermal Capacity, Heat Transfer, Combustion Data of Commercial Gases, Atmospheric Burners, Industrial Combustion Equipment, Temperature Control, Heat Salvage Methods, Gas Analysis and Fuel Comparisons.

The theory and practice of the combustion of gas, particularly as applied to industrial heating, is explained in detail. Further reference to individual subjects is facilitated by an extensive bibliography at the end of every chapter, while reference is made simple by a comprehensive Index of Subjects, Tables, and Charts. Altogether "Combustion" contains 208 pages, size 9 by 12 in. The other volumes, though somewhat smaller, are produced on similar lines.

By courtesy of the American Gas Association copies of these publications can be supplied by the Institution of Gas Engineers at the special prices fixed for members of the Association—viz., 10s. for each volume in the series, except "Combustion," which sells for 12s. 6d., including postage. Application should be made to the Secretary, the Institution of Gas Engineers, 28, Grosvenor Gardens, London, S.W. 1.

THE NEWS—continued.

Development of the Tees District.

A highly interesting and copiously illustrated brochure has been published by the Tees District Development Board, of 7, Queen's Square, Middlesbrough, with a view to directing attention to the facilities available in this area for the establishment of new industries.

The geological features of the area make it ideal for industrial development. The flat surface of the land ensures a minimum of cost in the levelling of sites, while its elevation is generally sufficient to ensure natural drainage. Rail, river, and road provide easy access to the sites available for development, while the area has excellent shipping facilities which lend themselves to the import of raw materials from any part of the world, and equally to the export of finished products. The district, which comprises the principal iron and steel centre in Great Britain, has also important shipbuilding yards, engineering works, foundries, and chemical works. It is situated on the fringe of the Durham Coalfield from which an abundant supply of excellent coal and coke is available at low cost. Public supplies of gas, electricity, and water are also available in adequate quantities at reasonable charges.

Referring to the local gas supply, it is stated that gas, having a calorific value of between 400 and 525 B.Th.U. per c.ft., is supplied in the area at rates varying between 4·19d. and 9d. per therm. The rate of 4·19d. per therm is one of the lowest in Great Britain.

The Pottery Trade.

Great Hopes from New Methods of Firing.

While our English pottery has improved remarkably in quality and design during the last fifty years, the methods of firing have altered very little.

Firing systems are now being looked into very seriously in the "Five Towns," which are the great centre of our pottery industry. Surprising as it may seem on first thought, a more expensive fuel than coal is being used, and it is not only reducing manufacturing costs in many directions, but is actually reducing the *firing* costs per article produced.

For example, the substitution of a gas-fired regenerative oven for a coal-fired one for firing electrical porcelain goods:

- reduced firing costs from 7½ p.ct. to 5 p.ct. of the selling price of the article;
- reduced the time taken in completing small orders from 14 to 3 days;
- reduced the "rejects" by 50 p.ct.;
- reduced furnace maintenance charges to a negligible sum;
- made possible the baking of the "biscuit" and the firing of the glaze in one stage instead of two stages;
- made possible the loading of much more ware in a given oven space.

These are a few of many advantages which have resulted from the installation during the last few years of a number of gas-fired ovens in place of coal ovens in Stoke-on-Trent. Full particulars of these important developments, together with illustrations, are contained in the current issue (No. 221) of "A Thousand-and-One Uses for Gas," which can be obtained free of charge on application to the General Secretary, the British Commercial Gas Association, 28, Grosvenor Gardens, London, S.W. 1.

Cookery Demonstrations and Exhibition at Loughborough.

In conjunction with Radiation Ltd. a series of cookery demonstrations and an exhibition of gas appliances were held in the Loughborough Corporation Gas Department Showrooms from June 20 to June 24 and from July 18 to July 22 inclusive.

The Chairman of the Gas Committee, Ald. G. W. Lloyd-James, attended on the opening days accompanied by members of the Gas Committee, and Mr. E. Onions, the Engineer and Manager. In introducing Miss D. J. Baker, of Radiation Ltd., Ald. Lloyd-James said that these demonstrations would definitely prove to the people of Loughborough the superiority of gas, and he deplored the misleading statements made by electricity canvassers in the town. He also quoted the opinion of a well-known power engineer, that having passed through the coal age we were now entering the "Gas Age," and there was a great future for gas. There was no possibility, he added,

THE NEWS—continued.

of Loughborough or any other gas undertaking closing down, as the electricity people would have the householders believe.

The demonstrations were well attended, great interest being shown, and they should do much to popularize gas for all purposes in the town.

Parkinson & Cowan, Ltd.

The Directors, in their Report for the year ended March 31, 1932, to be presented at the ordinary general meeting next Friday, state that, after making provision for redemption of debenture stock (£2795), and after paying debenture interest, providing for income-tax and depreciation of buildings, &c., on the usual lines, the net profit for the year amounted to £1122. The amount brought forward on April 1, 1931, was £7974, and the amount transferred from Reserve Account is £15,000, making a total of £24,096. The preference dividend for the half-year to Sept. 30, 1931, paid on that date (gross) was £16,937, leaving a credit balance of £7159, which the Directors propose to carry forward to the next account.

Following a careful examination of the position of the Company and its Subsidiaries, the Directors have thought it prudent to write down the book value of certain of the Company's investments, and to make other appropriations from the Reserve Account. As a result of these reductions the Reserve Account now stands at £37,134. Of the depreciation which has thus been provided, a considerable portion is due to the decision of the Directors to close down the operations of one of the Subsidiaries, which has failed to establish itself on a profit-earning basis.

The hoped-for improvement in world conditions has not yet materialized, and there has been a considerable contraction of turnover during the year in almost all departments of the Company's business. On the other hand, latest reports of progress in various directions afford ground for believing that a recovery may not be long delayed. In the meanwhile, the Directors have introduced substantial economies of which the full effect is not apparent in the present accounts. They regret, however, that the disappointing results of the year under review necessitate the further postponement of the outstanding half-year's preference dividend.

Two-Part Tariff at Burnley.

The Burnley Town Council have confirmed the recommendation of their Gas Engineer, Mr. J. H. Clegg, to inaugurate a two-part system of charge applicable to all ordinary domestic consumers, including those households to which small shops are attached.

The scheme has been introduced because of the extraordinary success which has attended the introduction of a four-part system of charge for industrial purposes two years ago. With the assistance of the four-part system new business has been introduced amounting to a consumption of 70 million c.ft. per annum. The four-part scheme has also been broadened to include all commercial consumers, as the two-part system is not wide enough in its consideration of the circumstances applying to the demand and use of gas in such premises as those occupied by Banks, Public Authorities, Building Societies, &c.

The two-part system has been designed to be simple in its operation, and briefly consists of a fixed inclusive charge amounting to 6s. 6d. per annum for each room which is contained in the premises supplied. This includes every type of room which can be used for the consumption of gas, including bathroom, wash-house, cellar, attic, garage, or greenhouse; with a minimum charge of 30s. per annum. The commodity charge is 4d. per therm. Unlike the accounts for the four-part system, which are payable monthly, the two-part tariff accounts are payable quarterly; they are subject to 5 p.ct. discount for payment within 21 days.

The adoption of the two-part system is, of course, optional.

Rewarding the Remunerative Consumer.

No attempt is being made at the moment to deal with prepayment consumers, who are already provided with a means for obtaining gas at cheaper rates based on the consumption. A quarterly return is made from the Collector's Office to each consumer of the surplus cash contributed in excess of that which is required to meet the reduced charge applicable to the consumption where it reaches 50 therms in one quarter. A reduction of 1d. per therm is allowed in this case from the maximum charge of 7·79d., and a further ½d. per therm if 250 therms or more per quarter is consumed. In each case the reduction is given on the whole of the consumption.

If the two-part system of ordinary charge meets with the success which is anticipated, further concessions may be granted to the prepayment consumers, as the Department is in the fortunate position of having a sum of money to disburse to its consumers from the income which is at the present time being received for gas. The principle of a general all-round reduction in the price of gas has been discontinued in Burnley, in order that benefits may be given to those consumers who provide the profits.

During the last two-and-a-half years Cottage Sets, which consist of a pendant lighting set, bowl, switch, and gas iron, have been supplied to prepayment consumers, who have paid for their installation by a reduction in the quantity of gas supplied per penny. This system has been most enthusiastically received by those consumers, a sum of no less than £1800 having been collected in this manner during the last financial year.

The scheme has therefore been extended, and it is now possible for consumers to purchase any appliance such as a cooker, gas fire, or water heater—any one article not to exceed a selling price of £10 in value. An appliance of this value is paid for by a reduction of 6 c.ft. per penny in the quantity of gas supplied through the meter, and 208,000 c.ft. is required to have passed through the meter before the appliance becomes the property of the consumer.

In order to avoid the installation of an excessive number of appliances which the consumer might be unable to pay for by this system, the reduction in consumption per penny is limited to a total amount of 12 c.ft. This means to say, with the ordinary rate of 26 c.ft. per penny, a consumer is limited to the purchase of appliances which necessitate a refund to the Department of 12 c.ft. for every penny consumed, the minimum setting of the meter being 14 c.ft. per penny.

Gas Engines for Rickshaws?

The Paper read by Dr. C. M. Walter at the 69th Annual General Meeting of the Institution of Gas Engineers on "The Use of Gas as a Fuel in Industry," particularly the section dealing with "The Application of Town's Gas to High Speed Internal Combustion Engines," has attracted considerable attention in Government, Local Government, Engineering, Transport, and Industrial circles at home and abroad. There is substantial active interest in the use of gas for such purposes, as being advantageous to any country desirous of securing some measure of independence from the use of imported oil and/or the utilization of its coal resources, while in Industry any extension of the economical use of gas cannot be ignored.

A report of the Paper, headed "A Rival to Petrol," appearing in the "Bombay Chronicle" of June 28, 1932, has resulted in the following inquiry being received by the Secretary of the Institution of Gas Engineers from Harda, India, from whom further particulars may be obtained by those interested:

> "We are very anxious to know if you will please inform us at an early date if you can manufacture light, steam, oil, or gas engines which, though light in weight, may be sufficiently strong to draw a rickshaw or light victoria or other light four-wheeled carriage. These light road traction engines should be as simple in their construction as possible and should have as few complicated parts as possible so that a person of ordinary understanding may be able to work them after a few lessons.
>
> "We wish these light machines may be installed in our High Schools and Colleges, where our students studying science and heat may derive some practical lessons from them.
>
> "Taking into consideration the notorious poverty of the Indian masses, it is suggested that these machines may be so priced as to be within the reach of the means of an ordinary trader, farmer, or business man.
>
> "In order to avoid rubber tyre troubles, these machines may be mounted on strong iron wheels or on strong cart wheels, so that they may be used on our country roads, which are not metalled everywhere and which cross unbridged rivers and sometimes may have to travel up and down a hill. What we wish is that these machines may be good substitutes for our country bullock carts and Tongas drawn by a strong pony or horse. Last year we heard from the Director-General that some engineering firms in England had succeeded in devising and inventing such light but efficient machines which may be used on ordinary roads, but complete information was not given. If iron wheels or cart wheels may not be considered feasible, solid rubber tyred wheels may do."

GAS SUPPLY IN JERSEY

A Special Correspondent describes a Visit to the Works of the Jersey Gas Light Company

It is satisfactory to find that, despite the fact that the population of the Island is not showing any marked increase, and in spite of the competition of electricity, the Jersey Gas Light Company, Ltd., of St. Helier, continues to make steady progress. In the course of a recent walk round the works, and conversation with Mr. Harry Morris, the Managing Director, it was gathered that the town has had a supply of gas for just over 100 years; the original works—the remains of part of the first retort house being still sentimentally retained—having been established in 1831 by Thomas Edge. By 1863 the undertaking had become a Company, but had not proved very satisfactory, and so it came about that the present Managing Director's father, the late Mr. Joseph Morris, left Guernsey for Jersey in the last-mentioned year, and remained in charge of the concern until 1911—*i.e.*, 48 years. That Mr. Harry Morris, to use the words of a well-known song, is following in his father's footsteps as regards long association with the undertaking, is evident from the fact that he joined it as far back as 1895—37 years ago.

Disturbing Incident in 1931.

Incidents in gas-producing establishments are always to be expected, but in the course of his long connection with the industry Mr. Morris and his staff have had none so serious and exciting as that which occurred in August of last year. A feature of the St. Helier Works is that a brook known as the Grand Val flows through the property, which latter extends to about 12 acres. Although for nearly forty years the brook has meandered along without trouble of any kind, in August, 1931, as the result of 24 hours' torrential rain, it overflowed its banks to such an extent that the water flooded the retort house to a depth of 4 ft. 6 in. above the clinkering floor—well above the firebars of the furnaces—completely cutting off the outlet flues to the chimney stacks. The charging of the retorts had to be discontinued, with the result that the supply of gas became exhausted and was interrupted for twenty hours between 8 p.m. on Aug. 25 and 4 p.m. on Aug. 26. During this time pumping operations were continuously in progress.

Extensions in Progress.

One result of the disturbing incident was to emphasize the need for greater gas storage capacity, with the result that a contract was placed with Messrs. Samuel Cutler & Sons, Ltd., for the construction of a new holder of 500,000 c.ft. capacity, but so arranged that it can later be extended to 750,000 c.ft. Good progress is being made with the erection of this holder, which it is hoped will be completed before next winter. The Company will then have four holders with a total storage capacity (reckoning only 500,000 c.ft. for the latest addition) of 1,310,000 c.ft.

Work is also at present in hand on the re-modelling of the retort house plant by the installation of electrically-driven stoking machinery, operated by power generated at the works, and it is expected that the new equipment will be ready for operation early next year.

"Getting the Load."

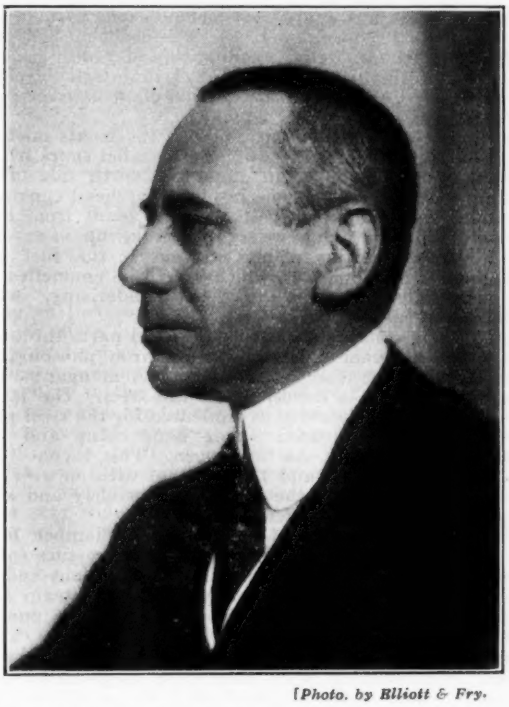
As Mr. Morris pointed out, there are only two main industries in the Island of Jersey—the growing of potatoes and catering for holiday makers. Hence there is little demand for gas for industrial purposes. In recent years considerable attention has been paid to encouraging the use of gas in every possible way with the object of "getting the load," in which encouraging progress has been made. No fewer than 56 p.ct. of the customers are supplied through prepayment meters, and for some years past, as one of the numerous charts in the Managing Director's office indicates, the day load has exceeded that of the night.

Although the unavoidable stoppage of supply owing to the flooding referred to above caused the loss of a few customers to the Company, this was more than counterbalanced by an addition of 310 new clients during 1931, bringing the total number at the end of the past year to 9361. During the twelve months, to meet the ever-widening demand, 3290 yards of additional mains were laid, bringing the total up to 73·68 miles, of which 6 miles are high pressure. Gas is supplied not only to St. Helier, but also to a number of outside places both on the east and west, and arrangements are in hand for a still further extension of the supply area. The Company has for a long period also undertaken the lighting by gas of the public streets of St. Helier, and has recently secured an extension of this concession until 1937.

Production Progress Since the War.

One effect of the flooding of the works was that, for the first time since the war, except for one year when electricity was first introduced, the diagram showing the sales of gas by the Company indicated a drop during 1931. It was, however, very small, amounting to only 337,700 c.ft., or 0·13 p.ct. The aggregate production last year reached a total of roundly 283 million c.ft., which, as affording an indication of the steady progress of gas consumption in Jersey, it may be mentioned contrasts with an output of only 136 million c.ft. in 1918.

New production records for the Company were set up just before last Christmas, when a daily output of 1,070,000 c.ft. was attained, and for the full week 6,939,000 c.ft. The Company works to a standard calorific value of 500 B.Th.U., with an actual average, taken over 875 tests during last year, of 506·4 B.Th.U. The coal used for carbonizing is all obtained from the Wear; the storage yards being of sufficient area to enable three months' supply to be always kept on hand. The Managing Director of the Company is justifiably proud of the fact that, despite the distance coal has to be brought, the price of gas in Jersey is less than the average in England.



[Photo. by Elliott & Fry.

Mr. Harry Morris, Managing Director of the Jersey Gas Light Company, Ltd.

The works are equipped with two sets of water gas making plants, and last year the Company made a larger use of water gas than previously—the total mixture having risen from 30·7 p.ct. in 1930 to 39·78 p.ct. This course was adopted for two reasons—first, because of the necessity for sparing the retort house while the extensions and alterations are in progress; and, secondly, because of the need to balance the sales of coke. The water gas addition has also been found of advantage in regulating the calorific value of the gas sent out.

The Training of Jersey-Born Employees.

The establishment embraces the usual stores, meter testing and repairing departments, as well as a stove repairing and re-conditioning shop. As there are not the same technical education facilities on the Island as exist in the large centres of the United Kingdom, the Company has to undertake the training of its own fitters, and in this connection it is interesting to learn that the great majority of the employees—old and young—are Jersey born.

In pre-war days, a good deal of the coke produced was shipped to France, but since that time it has been disposed

of on the Island, special provision being made for its grading for household and other purposes.

Up-to-Date Accounting Methods.

The offices of the Company are centralized with the attractively and neatly laid out showrooms, which were opened a year or so ago, and which have greatly stimulated the use of heating and cooking stoves and other gas-consuming apparatus in Jersey, the sales of which increased from 553 units in 1930 to 595 last year.

Under the guidance of Mr. E. Le V. Durell, the Secretary of the Company, an inspection was made of the mechanical machines which have recently been installed, and which have greatly expedited and simplified the accounting and record keeping. Indeed, like the works, the office side of the undertaking is an excellent example of modern methods.

On the social side, a large club-room is provided by the Company at the works. This is equipped with two billiard tables, as well as other amenities. The room is run entirely by the men.

From the foregoing, it will be seen that the undertaking of the Jersey Company is on thoroughly up-to-date and progressive lines. Mr. Morris is to be complimented not only on this, but also on the notable orderliness and tidiness of the various departments.

Gas Used Throughout Ford Finishing Plant*

By J. B. Nealey.

Ultra-modern in every respect the assembly plant of the Ford Motor Company, recently erected in Long Beach, California, stands as a model for efficiency in equipment and layout in both the assembly and finishing divisions. Furthermore, it has a pressed steel division, with presses running up to 105 tons, where are stamped out such parts as fenders, fender wells, running boards, dust shields, hoods, &c., to be distributed to all of the assembly plants on the Pacific Coast. The cost of this plant is in excess of $5,000,000.

The main building is 387 ft. by 920 ft., fronts on Long Beach harbour, and is served by two parallel spurs from a railroad, both of which run along the north side of the building, one outside and one inside. Overhead conveyors distribute stock and parts all over the plant from here. Equipment for finishing, ovens, &c., take up more than half the space in this plant, and gas is the fuel used throughout. Fenders, &c., which are to be enamelled are first put through a process known as " bonderizing," which prepares and rustproofs the steel.

Bonderizing consists of putting the steel parts through a solution of manganese phosphate and iron phosphate in water, at a temperature of 210° Fahr. A manganese iron phosphate coating is deposited on the steel. The layout for this process is somewhat complicated for the steel parts must be carefully cleaned before bonderizing and then thoroughly dried in a gas-fired oven. This layout takes up a space 32 ft. wide and 136 ft. long, with an overhead chain conveyor moving the parts, continuously and automatically, through the different steps.

The first unit consists of a sheet steel chamber 16 ft. wide and 40 ft. long containing tanks with pressure sprays above them. The first two contain soda solutions and the other fresh water. All are heated with live steam from gas-fired boilers and the solutions and water are pumped through the sprays onto the parts as the conveyor carries them along, the excess running back into the tanks for re-use. The conveyor then enters the bonderizing compartment which is also of sheet steel and is 18 ft. wide, 80 ft. long, and 10½ ft. high. The parts enter the bonderizing tank and make three passes through it, the time in solution being 10 minutes, after which they go through a rinse tank of hot water and then through a drying oven which removes all traces of water. The temperature of this oven is 450°-500° Fahr.

Muffle Oven.

The remainder of this plant includes a washer—tank and spray—and an oven 10 ft. wide and 45 ft. long. The oven is the full muffle type and is constructed of sheet steel, heavy insulation, and fire brick. The muffle is 8 ft. high and 5 ft. wide and occupies the upper portion of the oven. Below is the combustion chamber into which fire four gas burners from each side, the heat rising up around the muffle. A temperature of 450°-500° Fahr. is maintained and a chart kept by a recording pyrometer. There is 60 ft. of conveyor exposed from the exit end of this oven to the entrance end of the washing unit first described, and this is used for loading and unloading the parts. As the parts emerge from the oven they are transferred to a parallel conveyor which takes them to the enamelling ovens.

The enamelling plant is 380 ft. in length and includes two ovens and two dip tanks, all in one straight line, with a chain conveyor taking the parts through a two-coat process, continuously and automatically. Operators load them at one end and remove them at the other with the two coats dipped and baked on. There are three glassed-in enclosures, one at the loading end of the first oven and covering the first dip tank and loading operators, one between the two ovens and enclosing the second dip tank, and the third at the unloading end of the second oven and covering the unloading operation. In this way the entire system is sealed off so that no dirt-laden air from outside can penetrate. All fresh air used in this system is forced in through filters.

The ovens are of modified A type and each is 143 ft. long. They are heated with separate gas-fired heaters which set under each oven, the hot air being forced into the ovens by fans and through ducts. There are four heaters for each oven and two gas burners for each heater. The oven ducts, one on each side, start at a point 40 ft. from the loading end and extend for 70 ft. inside the oven. They are of sheet steel 12 in. by 32 in. in cross section, and are placed on the bottom and against the walls, there being openings at intervals for the heat to pass into the oven. These openings have hinged covers so that the flow of heat can be so regulated as to be distributed evenly throughout the oven.

The heaters are of the indirect-fired type in which the products of combustion travel in a circuitous path inside tubes, while the air to be heated is passed over the exterior of the tubes, the heat being transferred through a large area of fin radiating surface. The shell is built of sheet steel and is insulated to minimize radiation losses.

The fresh air is drawn through a filter to rid it of dirt and dust that might otherwise settle on the parts being enamelled.

Automatic Control.

The temperature in each oven is maintained continuously with an automatic temperature control, equipped with recording pyrometers which keep accurate charts of any heat fluctuations in different parts of the oven. A valve in the gas supply line is kept open, against a spring, by the pressure of gas exerted on a diaphragm, the valve and diaphragm being connected with a stem. A thermostatic valve is opened and closed by the expansion and contraction of a capillary tube which extends into the oven. When the oven becomes too hot the medium expands and the pressure on the diaphragm drops and the flow of gas to the burner is thereby reduced until the oven temperature has dropped to the point set on the regulator, when the reverse action takes place.

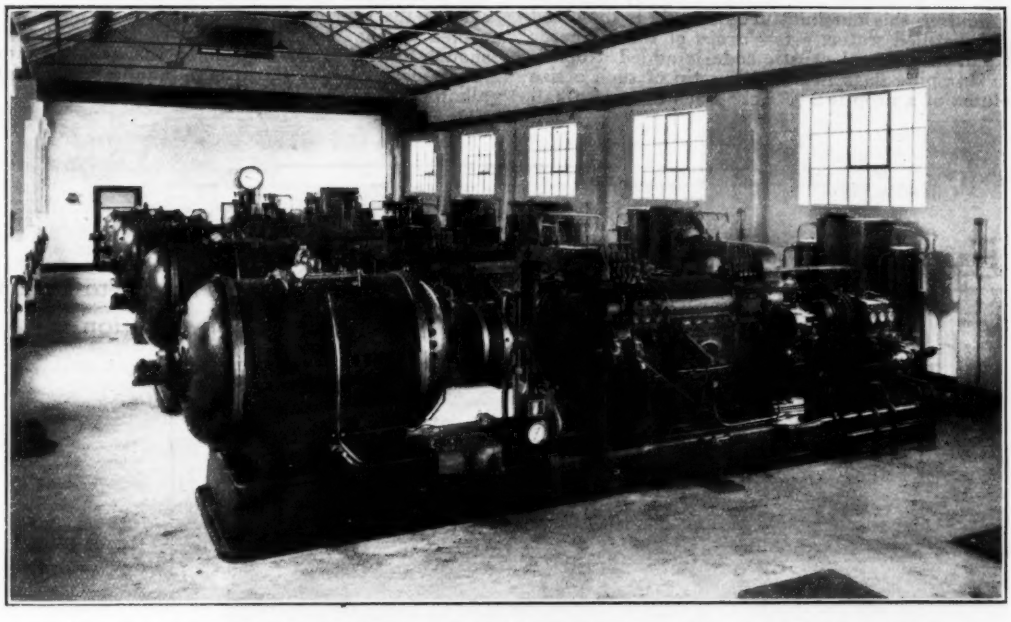
While this oven sets on supports about 5 ft. above the floor and resembles closely the A type oven, the legs on each end are hardly more than hoods. From each one of these hoods rises a venturi type stack, a fan forcing air into it, about half way up, through a short length of pipe serving as injector. Both coats are baked on at a preheat of 250° and high heat of 440° Fahr., 45 minutes for each coat.

Alongside this oven is a burn-off oven through which the work is first run to burn off any grease and dirt, and in conjunction with this is a washer with tank and sprays. A system of pumps and pipe lines supply paint, enamel, &c., from the storage tanks to all parts of the finishing division, and this system is directly connected with the enamel tanks of the ovens just described. In case of fire these tanks are automatically drained in less than 8 minutes. All of the units in the finishing division are served with an automatic fire protection system of the chemical spray type.

The final assembly line is 560 ft. in length and runs at a speed of 140 in. per minute. It requires only 48 minutes to assemble a car complete from the time the chassis is put on the head of the line to the time its tank is filled with gasoline and it is run off under its own power. While the capacity of this plant is being increased it will turn out, at the present time, 400 completed cars and trucks every 8 hours.

* From the American Gas Association Monthly.

High-Pressure Distribution in Sydney



BOOSTING PLANT AT THE ALEXANDRIA STATION OF THE AUSTRALIAN GAS LIGHT COMPANY.

Consisting of five 280 H.P. Michell crankless boosters and gas engines, each machine being capable of sending out 500,000 c.ft. of gas against a pressure of 200 in. W.G.

In connection with the paper read by Mr. T. F. Waugh (Distribution Engineer to the Australian Gas Light Company) before the Engineer Surveyors' Association (Australasia), Inc., published in the "JOURNAL" for July 27 (p. 202), and the Editorial in reference thereto (p. 188), it is interesting to note that the firm of Messrs. George Waller & Son, Ltd., of Phœnix Iron Works, Stroud, Gloucestershire, were entrusted with the contract for the boosting plant mentioned by the author.

These machines, stated Mr. Waugh, were the first commercially produced engines and boosters of this size and power in the world, and to-day he is confident that they have in these machines a unique plant, which is also the largest individual boosting plant of its kind in existence.

The accompanying photograph illustrates the five units referred to in the paper, installed at the Alexandria Station, and which are functioning in so satisfactory a manner. Similar sets of boosters have been supplied by Messrs. Waller & Co. to the Adelaide Gas-Works and the Metropolitan Gas Company of Melbourne.

One of the principal advantages of this type of machine is the very wide range of volume at constant pressure.

IN CONTINENTAL COUNTRIES - - -

Abstract Translations from the Technical Press of France and Germany

ARTIFICIAL RESINS FROM AMMONIUM THIOCYANATE AND GUANIDINE.

An abstract in "Das Gas- und Wasserfach," 1932, 75, 595 (July 16), of a paper by Keller and Nüssler in "Berichte der Gesellschaft für Kohlentechnik," 4 [i], 32, states that guanidine thiocyanate, guanidine carbonate, ammonium thiocyanate, and mixtures of these with thiourea were heated under a reflux condenser with 40 p.ct. formalin in the ratio of 0·75 molecules of substance to 2 molecules of formaldehyde. The condensation products hardened when the water formed was removed by air drying or heating to 70-80° C. The resins were pulverized and moulded under a pressure of 3000 lbs./sq. in. at 100° C. Guanidine thiocyanate resin gave the best blocks. Very tough products were obtained when about 20 p.ct. of fine sawdust and some hexamethylenetetramine and stearic acid were added to the powdered resin before moulding. The production of artificial resins may be a new bye-product branch of the Gas Industry.

MANUFACTURE OF GUANIDINE SALTS FROM AMMONIUM THIOCYANATE.

According to an abstract in "Das Gas- und Wasserfach," 1932, 75, 595 (July 16), of a paper by Gluud, Keller, and Schultze in "Berichte der Gesellschaft für Kohlentechnik," 4 [i], 21, guanidine thiocyanate is obtained in a yield of 80-85 p.ct. of the theoretical when gaseous ammonia is passed into fused ammonium thiocyanate. Carbon disulphide and ammonia are obtained as bye-products and may be reconverted into ammonium thiocyanate by heating at 100° C. under pressure.

Guanidine thiocyanate is an important raw material for the manufacture of other guanidine salts. By the action of sulphuric acid, the bisulphate is formed and this, on treatment with lime, yields the normal sulphate from which the chloride or nitrate can be obtained by treatment with calcium chloride or nitrate. The carbonate may be obtained from the sulphate by successive treatment with baryta and carbon dioxide.

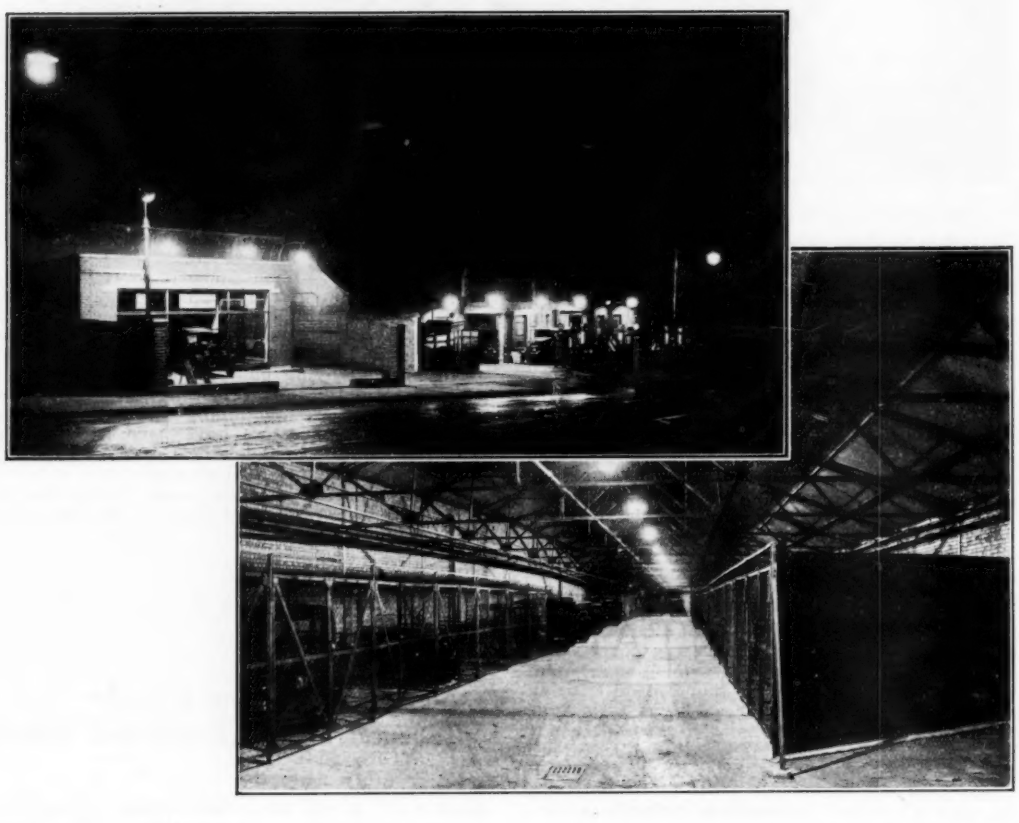
RAPID DETERMINATION OF FREE ACIDITY IN AMMONIUM SULPHATE.

E. König in "Brennstoff-Chemie," 1932, 13, 265-266 (July 15), describes a rapid routine test which may be carried out in the sulphate house. The indicator used is a mixture of methyl red and methylene blue which gives a very sharp colour change from reddish violet via dirty green to bright green and is specially suitable under conditions of bad illumination. The test may be employed by the sulphate-house labourer who can thereby satisfy himself that the sulphate in the whizzer has been washed to a

sufficient extent. From the whizzer, a little of the salt is taken from several places, the increments are mixed and 10 grammes are rapidly weighed out on an apothecary's scale, or may, less accurately, be measured out by means of a container holding this amount. The sample is dissolved in 100 c.c. of distilled water; a few drops of the indicator are added; and decinormal caustic soda is added drop by drop from a dropping flask fitted with a tip of such a size that the volume of a drop is 0·05 c.c. Each drop of alkali used represents 0·00245 p.c. of free acid. A table, protected with a glass cover and hanging in the sulphate house serves to correlate the number of drops of alkali used and the percentage of free acid in the sulphate. For the wet salt, if the specification for Grade 1 sulphate is to be attained in the dry salt, not more than 6 drops of alkali should be required to produce the colour change in the indicator. For dry salt, the maximum number of drops of alkali is 12.

An Example of Efficient : Gas Lighting :

Furnished by an Up-to-Date Garage Installation



Our illustrations show the extension recently made to the original building of the Ecclesbourne Garage, High Road, Palmers Green, N., in connection with which it has again been decided that gas is the cheapest and most effective illuminant.

The original premises were, until 1930, entirely illuminated by electricity, but, being greatly impressed by the excellent examples of gas lighting outside certain business premises at Palmers Green, the Directors of the Company decided to invite the Tottenham and District Gas Company to submit a scheme for the re-lighting of their premises in competition with the local electrical undertaking.

After a keen scrutiny of both schemes, a decision was made in favour of gas, the installation consisting of six 1000-c.p. Suggs " Rochester " lamps, fitted with chromium plated parabolic reflectors and distant control devices, connected in series of two and four, for the lighting of the front of the building, and, in addition, two 1000-c.p. lamps mounted on 14 ft. columns with clock-work controls, at the North and South entrances of the carriage-way.

The interior lighting was effected by means of three 1000-c.p. lamps in series of two and one, the distance control cocks being conveniently fixed in one battery. This installation was referred to in the " JOURNAL " for April 15, 1931 (p. 156).

At the end of twelve months, during which time the Directors were entirely satisfied with the efficiency and running costs of the installation, it was found necessary to make an extension of the premises, comprising new showrooms and garage of approximately 320 ft. by 50 ft., and the Gas Company were invited to prepare a scheme of lighting for this extension, being informed at the same time that the matter was one where competition would have to be faced.

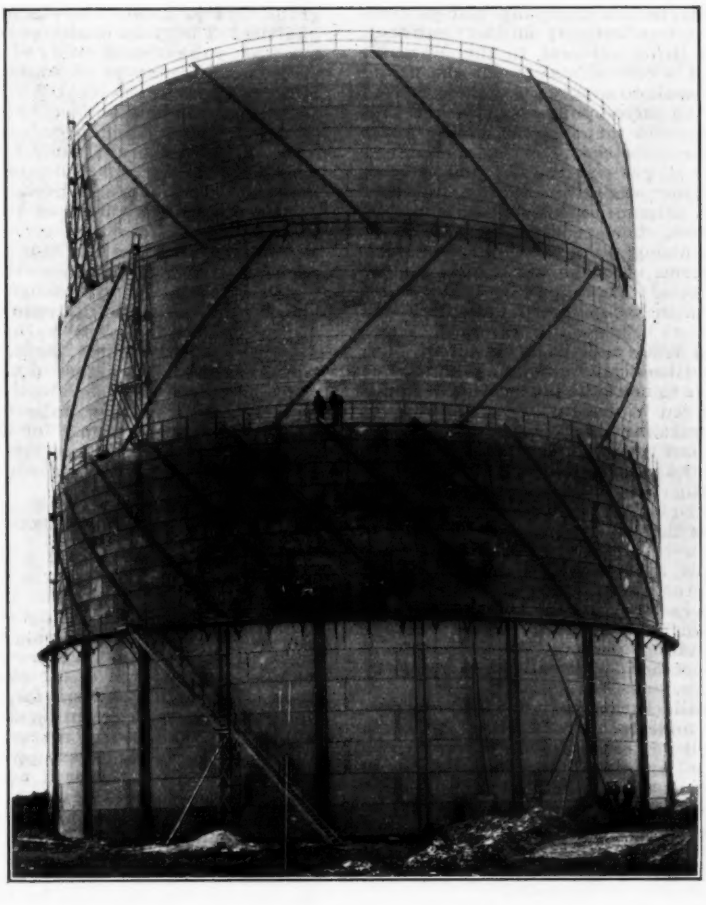
After full consideration their tender was accepted, and the extension has been equipped internally with ten 1000-c.p. " Rochester " lamps, fitted with distant control devices, in series of five at intervals of approximately 30 ft. In the car wash-yard are two similar lamps on specially constructed columns and fitted with parabolic reflectors, which are controlled from inside the garage.

The carriage-way is illuminated by a 1000-c.p. lamp fixed on the side wall, and the showroom exterior by means of four of the same lamps, also with distant control devices; the whole of the exterior lighting being controlled from inside the building.

The total number of lamps installed in the whole of the new premises is twenty-eight 1000-c.p. units, representing an hourly consumption of 600 c.ft. of gas and showing the excellent lighting that can be effected by the efficient application of gas.

NEW GASHOLDER AT - - SKEGNESS - -

One Million C.Ft. Capacity, erected by Messrs. Samuel Cutler & Sons, Ltd.



The following account is taken from the "Skegness Standard" of Aug. 3:

Our photograph gives an excellent idea of the new landmark which has come into being at Skegness in the shape of a gasholder, the construction of which has now been completed. Incidentally, the structure affords further evidence of the growth of the resort and the steps which are being taken to ensure keeping abreast of the demand for gas which, in recent years, has been an outstanding feature of the public services controlled by the local authority.

Deserved tribute to the capabilities and energy of the firm which has made the gasholder available for the "peak" period of the year was paid by Dr. B. Sweeten, J.P., Chairman of the Skegness Gas Committee, in the course of the July meeting.

The gasholder, except for the painting (said Dr. Sweeten) was now practically complete and was at present being filled with air for testing and the usual adjustments.

Dr. Sweeten proceeded: "Messrs. Samuel Cutler & Sons, the contractors for the job, have worked hard and also gone to considerable expense to give us the holder for August. Cutlers' were under no time limit. The only time limit that would have been of any use to us is one that would have ensured the holder being ready for our season and, had there been eight, ten, or twelve months available, a time limit would have been enforced. As it was, the time was so short that no contractor would accept a time limit to finish in July. Notwithstanding this, Cutlers' set themselves out to do their best. They have never given us any promises in the matter, but have merely told us that they would complete for August if possible.

"The foundations were only finished in February, and the firm commenced the erection of the holder and tank on the 20th, which means the holder will be finished in just over five months.

"It has been a remarkably quick job, quicker than we had believed possible; and I am sure they deserve the Council's very best thanks as, without the holder, our distribution difficulties this coming August would have been tremendous, and many people might have had to suffer from insufficient pressure, apart from the insecurity through lack of storage."

The members warmly endorsed the Committee Chairman's tribute to the firm, and Councillor Wood (Chairman of the Water Committee) observed that it might interest the Council to know that his Department had supplied 2,300,000 gallons of water for the holder.

The Holder Described.

The erection depicted in our photograph is a million c.ft. three-lift spiral-guided holder. It is some 120 ft. in diameter, and stands, when full, over 130 ft. high. The holder tank contains approximately 11,000 tons of water.

The foundation is of reinforced concrete, carried by 258 cast-in-place "Vibro" piles, each 50 ft. long, the bottom ends being bulbed.

While nothing was said at the Council meeting regarding the part played by Mr. Fred Young, Assoc.M.Inst.C.E., the Engineer and Manager of the works, it is generally known that the entire scheme was prefaced by this gentleman, and that he has thrown himself heart and soul into his share in its fulfilment. Residents as a body fully appreciate what Mr. Young has done in building up and maintaining the gas supply of the town since he assumed charge of the concern.

We learn that the testing was completed and the gasholder put into service on July 30.

New Coking and Bye-Product - Plant at Pont Brûlé* -

An Installation by Gas Chambers and Coke Ovens, Ltd.

Some few years ago the Imperial Continental Gas Association, a well-known British Company and pioneers in the development of the Gas Industry on the Continent, acquired a site at Pont Brûlé adjacent to the Maritime Canal, for the erection of a central station for the manufacture of gas on a large scale to supply a gas grid, serving Antwerp, Brussels, and the surrounding country, and thus enabling them to dispense with their several smaller works in Brussels and the adjacent districts.

While the manufacture of gas was the first objective of the Company, consideration was given to the fact that there existed in Belgium a large market for metallurgical coke; naturally, therefore, it was determined to adopt coke ovens as the carbonizing plant. The first installation comprises two batteries of ovens by Messrs. Simon-Carves, Ltd., having a total throughput of 1000 tons of coal per day, together with complete coal-handling and bye-product plant.

Early in the spring of 1930, and, as a matter of fact, before the first ovens had been put in commission, it was deemed advisable, in order to meet the prospective demands for coke and gas, to proceed with a further installation of coke ovens, and tenders were invited from British, Belgian, and German firms. Various types of plant were inspected, both under construction and in operation, and as a result of a most exhaustive investigation the contract for the new installation was awarded to Gas Chambers and Coke Ovens, Ltd., of London, who are the sole British licensees for the Collin type of plant.

It may be pointed out that Gas Chambers and Coke Ovens, Ltd., were the actual contractors for the complete installation—*i.e.*, coke ovens, bye-product plant, and benzole rectification equipment, extensions to the coal storage and coal and coke handling plants, coal-crushing and blending equipment, together with all the necessary machinery and auxiliaries.

Another important consideration in favour of the contractors was that they undertook to build the plant in 15 months. It speaks well for the enterprise of this British firm that they actually completed the installation in 12 months, an achievement of considerable merit having regard to the fact that the job was carried out in a foreign country on ground which was bad and necessitated the driving of 1350 60-ton concrete piles for carrying the foundations.

Coal Handling and Storage.

The necessities for coal unloading and storage were met by extensions to the existing plant, and in order that complete understanding of the sequence of operations should obtain, it will be advisable to outline the methods of unloading and storage which existed prior to these extensions. Owing to the possibility of water-borne supplies of coal being cut off during the winter months, it was necessary to provide for carrying somewhat heavy stocks; as a matter of fact, the present site provides for storage of upwards of 50,000 tons. As previously stated, the plant is situated adjacent to the Maritime Canal, the staithes on the canal affording accommodation for boats up to 3000 tons burden.

The water-borne coal is handled by two distinct units of plant; each unit comprises a jib crane which carries a 2-ton grab. One delivers to a fixed hopper feeding direct to a belt conveyor, the second into a portable hopper which travels a short length of gantry and also delivers to the belt conveyor which extends for the full length of the coal-stocking yard, on a built-up steel bridge, and is fitted with a travelling throw-off carriage. The stocking ground is spanned by two travelling gantries, which are provided with belt conveyors and throw-off carriages. These gantries travel the full length of the ground, which is 1180 ft. The gantry conveyors receive the coal discharged from the longitudinal conveyor, delivering from the canal, and distribute it to any part of the stocking ground. The unloading plant has a capacity of 175 tons per hour.

Coal is also brought to the works by rail, the works sidings connecting up with the main lines of the continental railways. The rail-borne coal can either be discharged direct into the boot of the main raw-coal elevators serving the crushing and blending plant or alternatively be discharged into stock. The coal is re-claimed from stock by three travelling gantries which are fitted with grabs, and pass over the top of the distributing conveyor gantries. The grabs discharge on to conveyors, which take the coal to the boot of either of the two raw-coal elevators, each of a capacity of 75 tons per hour; a separate boot is provided for each elevator. The elevators raise the raw coal to the top of the blending and crushing plant situated in a four-storey building substantially constructed in reinforced concrete, and deliver on to a shuttle conveyor which discharges into either of the four 200-ton blending hoppers. The hoppers deliver through adjustable feeds and revolving feed tables on to scraper conveyors feeding into any of the four Carr type disintegrators. The disintegrators are driven by 85-H.P. motors, and each has a capacity of 40 tons per hour. Normally three are on duty with one standing by, though two units worked for 16 hours a day meet the full requirements of the plant. The disintegrators discharge to a scraper conveyor, which, driven by a 7-H.P. motor, feeds to the boot of either of the two crushed-coal elevators of similar capacity to the raw-coal elevators. The elevators deliver to the crushed-coal bunker, which has a storage capacity of 1300 tons—*i.e.*, equal to one day's supply for the ovens.

A water-storage tank is carried over the bunker, which gives 120-ft. head for the water supply throughout the works.

The Coke Ovens.

The coke ovens comprise a battery of 54 Collin patent compound regenerative ovens 39 ft. 4½ in. long between doors, 14 ft. 9 in. high, with an average width of 16½ in., having a throughput capacity of 1300 tons of coal per day, the capacity of each oven being 16·75 tons and the carbonizing time 16·5 hours. Contrary to the usual practice of heating only one-half of the oven wall or walls at a time, as in the twin-flue and similar systems, in the Collin oven the walls are heated continuously throughout their whole length with half-hourly reversals by the alternated combustion of the heating gas upwards during one period and downwards during the next period, and so forth in every one of the heating flues in each wall. It will thus be seen that the whole of the wall of the oven is continuously heated by flame.

During the upward firing, the gas and air from the regenerators meet at the bottom of the heating flues and the flame sweeps the walls for the full height, the products of combustion leaving the flues at a point slightly below the level of the top of the oven charge, and passing downwards to the regenerators through vertical connecting ducts in the division walls between each two adjacent heating flues. During the downward firing the air from the regenerators passes upward through the same vertical ducts to the combustion point at the top of the heating flues (which again is slightly below the level of the top of the oven charge) where it meets the gas. The resulting flames sweep downwards the full depth of the flues, and the products of combustion pass direct through ports into the respective regenerators.

As there is no cross-over of flame or products of combustion from any one flue or set of flues to another flue or set of flues, the "free space" above the charge remains comparatively cool, as was distinctly observable, and the difference in temperature between the top of the coal charge and the "free space" being approximately 200° to 300° C., the gas in the "free space" is not subject to undue cracking with its attendant evils.

It will already have been noted that the ovens under consideration (14 ft. 9 in.) are high ovens, but at the same time it must be remembered that the possible height of the Collin oven is not limited by any difficulty in heating them, the length of travel of the heating gases in the combustion flues being only equal to the height of the oven charge, and not (as in other types of ovens) to more than twice this height. The limitations both as to height and length of oven are mainly dependent upon handling facilities. A further important and very noticeable feature was that the oven tops were cool and consequently provided increased comfort for the operators.

The Collin system of heating, with its accompanying uniformity, gives a remarkably low fuel consumption, while the absence of cross-over flues assists in ensuring the elimination of cracking in the "free space"—which

* From the "Iron and Coal Trades Review" for July 22, 1932.

naturally results in a high yield of bye-products. Further, the method of heating necessitates an extremely simple arrangement of gas and air supply pipes in the galleries; in fact, the arrangements are such that any number of ovens or sets of ovens may be heated with producer gas, coke oven gas, or a mixture of the two, and varied from day to day to meet market requirements. Changes over can be effected in a few minutes while the plant is in operation. A very ingenious patented device is fitted on the rich-gas supply pipe to each flue, which automatically admits air during the actual period of reversal and effectually prevents the formation of graphite in the gas burners. These valves are operated by the reversing gear.

The oven doors are of the self-sealing type and are certainly highly efficient. At the time of our representative's visit to the works there was not a vestige of leakage, indeed so far as that portion of the works was concerned there was nothing to indicate that the ovens were in operation. The battery is carried on an elevated reinforced-concrete raft, which provides clear and roomy access underneath for the easy regulation and adjustment of the gas and air supply during operation. The ovens are carried on a series of thick substantially built parallel walls running directly under each oven wall and separating the sets of regenerators. There are no sole flues between the ovens and the regenerators, nor are there any arches carrying the weight of the ovens.

The coke is discharged on to a coke-quenching car having a capacity of 13½ tons, and a total length of 50 ft. between end plates and weighing approximately 60 tons.

The coke car with its full charge is travelled to the quenching tower, which is adjacent to the main coal bunker, by an electric locomotive built by A.E.G. On arrival at the quenching station the circuit is automatically completed to operate a water valve. Surplus water passes to the breeze-settling system, the clear water being allowed to pass back to the canal.

The charging larry, coke pusher, coke guide, and quenching car were designed and supplied to the order of Gas Chambers and Coke Ovens, Ltd., by the Wellman Smith Owen Engineering Corporation, Ltd., of London, and were built by their associated company in Belgium.

Coke-Handling Plant.

The quenched coke is hauled from the quenching station to a ferro-concrete coke wharf paved with cast-iron plates —having a capacity of four oven charges—and is discharged thereon from the coke car. The coke is delivered from the wharf through finger gates operated from a covered walkway at the foot of the wharf on to a 36-in. Robins conveyor 350-ft. centres delivering to a grizzley. The over-size from this screen 88 mm. may, by means of a belt conveyor, be delivered direct into wagons on the sidings, or alternatively direct on board ship at the maritime wharf or into stock by belt conveyors. The through material is delivered on to a second Robins conveyor, which feeds it either to wagons or to a 20-in. Robins conveyor 1200 ft. long for passing to the final screens and boiler house, the latter two units forming part of the first installation of plant. The Robins conveyors were supplied by Fraser & Chalmers Engineering Works, the whole of the mechanical parts being made at Erith.

Bye-Product Plant.

Considerable thought has been given to that vitally important factor in plants of this nature—accessibility to every component—which also means that there is plenty of room for movement in the various buildings. In the construction of the buildings there has been no cheeseparing. Liberally proportioned, exceptionally well lighted, they are also carried out in a style which cannot fail to impress the visitor. The whole of the floors are laid with tiles. The walls for a portion of their height are lined with glazed tiles and the remainder colour washed. In a few years' time, however, it will no doubt be found that the saving in maintenance costs of the plant have more than justified the little initial additional capital outlay.

Machinery House.

The machines installed include two high-speed steam-driven turbo-exhausters, each capable of dealing with 780,000 c.ft. of gas per hour. A Junkers regulator, which controls the pull on the hydraulic main, is fitted at a point where the foul gas main connects to the hydraulic main and by electric relay adjusts the suction on the foul gas main through the three primary coolers, by operating butterfly valves on the exhauster by-passes. From the exhausters, the gas passes through two secondary water-cooled condensers, and thence it may be passed through the P. & A. type rotary tar extractor. As a matter of fact, our representative was informed that this extractor has not been found necessary owing to the use of high-speed turbo-exhausters, and, although installed, it is not now in commission.

From the secondary coolers, therefore, the gas now passes direct through three 90-ft. grid-filled tower-type ammonia scrubbers and thence to three 100-ft. grid-filled tower-type benzole scrubbers. The coke oven gas required for heating the ovens, removed at this point and without purification, is then led through an automatic pressure controller and delivered to the 17,000 c.ft. capacity balancing gasholder. This balancing holder, of the single-lift column-guided type, accumulates the heating gas during reversing, and thus avoids fluctuations in the purifiers, the surplus gas being delivered direct to the purifiers. The whole of the coolers and scrubbers are neatly arranged in two parallel rows and are mounted on a combination reinforced-concrete stallage, underneath which the condensate tanks are located.

Sulphate Plant.

The sulphate plant is housed in a large reinforced-concrete brick-panelled building, and is capable of dealing with seven days' liquor production in five working days, the ammonium sulphate recovered being in the neighbourhood of 15 tons per day. The production of sulphate is carried out by the indirect process, the whole of the make of liquor being dealt with in a single saturator, which is fitted with a Collin patent revolving bronze distributor for keeping the liquor in movement to assist in large crystal formation and for avoiding local alkalinity. A complete lime-mixing plant delivers the necessary milk of lime to the two-column Collin patent still, and the ammonia vapour from the still is cooled and dephlegmated in a reflux cooler. The Collin patent saturator is constructed of steel plate, lead-lined, and provided with acid-resisting brick lining. The mother-liquor tank is also lead and brick lined.

The salt, together with some concentrated liquor, is ejected into a lead-lined crystallizer, whence, after the crystals have had an opportunity for growth, the salt is delivered to a Haubold centrifugal dryer. The crystals on leaving the whizzer contain 2 p.ct. moisture, and are delivered into a steam-heated store or into glass-lined bagging hoppers. No further drying has so far been found necessary, and neutralization is effected in the whizzer basket.

Benzole Plant.

The benzole plant has a capacity of 15 tons of crude benzole per day, and, housed in a roomy, well-ventilated and lighted building, is complete with heat exchangers, wash-oil preheaters, wash-oil still, light-oil coolers, light-oil preheater, light-oil still, and crude benzole cooler. The production of crude benzole which gives a distillation test of 100 p.ct. at 180° C., and is therefore naphthalene and wash-oil free, is continuous, and it is stored at this stage in suitable tanks, and then treated intermittently in the benzole agitator, fractionating pot still, and benzole cooler. The products—*i.e.*, rectified benzole, toluole, and solvent naphtha—are collected separately in a four-compartment receiver. Underground storage tanks are provided for this refined benzole, and steam pumps are fitted for loading into wagons. Naphthalene pans are also provided for the light oil still residue, the naphthalene being periodically removed and the residue returned to the wash-oil circuit.

A complete acid-regenerating plant, consisting of acid agitator, separating tank, and mother-liquor service tank, together with pot still, concentrated ammonia-liquor tank and cooler, is provided for the complete recovery of acid, raw benzole, and tar. This plant obviates obnoxious residues; such residue as is left in the pot still contains neither acid nor benzole and is passed back into the tar services.

Instruments and Recorders.

The system of recording and measurement throughout the works is very complete, and is made as simple as possible by the method of grouping. Thus the whole of the instruments pertaining to the coke ovens are grouped round the room which houses the reversing winch. The instruments here installed comprise a duplex pressure recorder connected to the mains of the heating gas on the engine side. The top pen records rich gas and the bottom pen producer gas, whichever may be in use for the time being. A similar recorder measures the pressure of the heating gas on the coke side. A vacuum recorder measures the draft at the stack. The oxygen content of the flue gases is measured by an "Omeco" recording apparatus. Flue-gas temperatures are taken by a Leeds & Northrup recording pyrometer. In conjunction with the exhauster plant there is a battery of fifteen pressure and vacuum gauges.

A duplex vacuum recorder (superposed) is connected respectively to the inlet of the first primary condenser and the inlet of the exhauster. A pressure recorder is connected into the inlet of the first secondary condenser, and a similar instrument is connected to the inlet of the first

ammonia scrubber. The vacuum and pressure recorders on this plant are connected so as to operate in conjunction with the indicating pressure gauges. A steam meter is provided for the measurement of the flow of steam, coming from the boilers and consumed by the exhauster. Also a steam-pressure gauge is located in the main connected to the steam-flow meter.

In the sulphate plant a steam meter is provided to measure the live-steam consumption. A flow meter also measures the flow of ammoniacal liquors passing to the still, and a flow indicator is also provided so that the operating conditions can be seen at once. A recording potentiometer pyrometer (Leeds & Northrup type) measures the temperature at the outlet of the still.

In the benzole plant a steam meter records the live-steam consumption of the superheater, still, &c., and there is a steam-pressure recorder. Also there is a meter for measuring the rate of flow of benzolized wash-oil to the wash-oil still, which is again provided with an indicator.

In the pump house are three " Integra " flow meters, measuring respectively the heating gas, the surplus gas for distribution, and the producer gas for coke oven consumption. There is a water meter for measuring the flow of fresh water sent to the ammonia scrubbers. Also a Leeds & Northrup 6-point recording pyrometer, measuring by means of resistance thermometers the temperature of: (*a*) Gas into ammonia scrubbers, (*b*) gas into benzole scrubbers, (*c*) wash-oil to benzole scrubbers, (*d*) cooling water to condensers, (*e*) gas inlet of condensers, (*f*) gas outlet of condensers.

The whole of the instruments referred to above were supplied by the Integra Company, Ltd., of Liége, whose British offices are at Broad Street, Birmingham.

In conclusion, it may be interesting to note that this plant was originally designed for a throughput of 1200 tons per day, but subsequent to the order being placed the width of the ovens was decreased, at the request of the clients, from 17⅜ in. to 16½ in., which enabled the coal throughput to be increased to 1300 tons per day. The regenerators were not modified, and, indeed, no other modifications were made. All the original guarantees (as given for the 1200-ton throughput) were achieved, which clearly demonstrates the ample margin embodied in every section of the plant.

The accompanying schedule gives the guarantees, together with the results achieved at 1200 tons and 1300 tons daily throughputs, the figures in connection with the latter being extracted from the official test records.

The coal used was a mixture of Belgian, English, and German, containing about 7½ p.ct. moisture. The coke produced was of excellent quality, and had a shatter test (1½) of approximately 95.

Guarantees and Operating Results.

—	Guarantees.	Achievements.	
		1200 Tons per Day.	1300 Tons per Day.
Maximum flue temperature, ° C.	1300	1287	1319
Temperature of oven walls after pushing, ° C.	—	1050 to 1100	1950 to 1100
Fuel consumption (coke oven gas) therms per ton of coal (corrected to " basic " coal containing 6 p.ct. moisture)	19·5	18·5	19·5
Calorific value of gas made— B.Th.U. per c.ft.	540	550	536
Inerts in gas, p.ct.	9	6	6·4
Gas temperature in space above coke 1 hour before pushing, ° C.	900	775	789
Moisture in large coke, p.ct.	3	1·9	2·01
Benzole in gas after scrubbers— Grms. per cub.m.	2	0·9	2
Ammonia in gas after scrubbers— Grms. per cub.m.	0·03	0·01	0·02
Loss in effluent liquor from ammonia still—Grms. per cub.m.	50	10	10
Steam consumption per kg. crude benzole—kgs.	4·3	..	4·1

We desire to acknowledge our indebtedness to the Imperial Continental Gas Association and their subsidiary Company, the Cokeries du Brabant, also to Mr. Coune (the General Manager of the latter Company), for permitting our representative to go over the plant, which in design, conception, lay-out, and auxiliary equipment may well be said to represent the latest word in coke oven practice.

Copper Service Pipes*

By the Research and Engineering Dept., Mueller, Ltd., Sarnia, Ontario.

Although copper pipe was used by the ancients for water distribution; and although, on the initiative of Mueller, Ltd., copper service pipe is being extensively used in all territories in Canada and the United States for the distribution of water under varying soil conditions, the data available from the practical use of copper pipe for gas distribution is comparatively limited. So far as our records indicate, its use in the Gas Industry in Canada has been confined to gas meter connections where its " body," tensile strength, and flexibility have recommended it very strongly. Because of the lack of actual data applicable to the Canadian territory, we prefer, with your permission, to confine ourselves to the general features, favourable or unfavourable, to the use of copper pipe on gas distribution.

Thin walled copper pipe, adopted because, notwithstanding the thinness of wall, it has an extraordinarily high tensile strength, is made from copper approximately 99·9 p.ct. pure.

It has exceedingly high tensile strength which, as applied to water services, recommends it very highly because of its resistance to frost action and settlement of soils.

Except in soils impregnated with acids formed by moisture in contact with iron oxides, such as cinders, &c., copper pipe is highly resistant to the action of soils which cause extensive and rapid corrosion on steel or iron pipe.

Because of its high conductivity it is less affected by electrolysis if proper care is exercised in insulating its contact with other more resistant metals.

Where laid in shelves in trenches for water or other classes of mains, its tensile strength limits leaks caused by soil settlement or other causes.

In sizes up to and including 1¼ in., it is furnished in coils of 60 ft.; in larger sizes in lengths up to 20 ft.

The type of coupling with integral radius developed by Mueller, Ltd., for domestic water service connections is, our experience and experiments indicate, equally suitable for gas connections, which can be completed by unskilled labour with the minimum number of tools.

Actual tests on water under pressure are detailed below:

Two lengths of copper pipe, connected by a double copper coupling of the radiused joint type, suspended under water pressure as high as 75 lbs. on an angle testing frame at water works conventions in the cities of Montreal and St. Catharines; at special demonstrations in the cities of Toronto, Winnipeg, and Vancouver, not only stretched over 10 in. in a length of less than 30 ft., but dropped 30 in. without leaks.

Because sulphur has an injurious effect on copper, each gas distribution system distributing water, coal, or butane-air gas must determine whether the gas will have an injurious effect on the inside of the pipe.

Where gas, distributed under comparatively low pressure, contains tar or other substances which deposit on the inside of the pipe, precaution must be taken to prevent a " trap " which would eventually prevent the flow of gas. Where this condition is experienced, a hard-drawn pipe is furnished.

Based on the current copper market, copper pipe compares favourably with steel or wrought-iron pipe in first cost; because of its flexibility, &c., service connections can be completed at a lower labour charge.

We submit for the consideration data from practical experience in the use of copper service pipe for domestic water service connections:

In a western Canadian city of over 200,000 population the copper services, completed about five years ago to replace other service material which it was necessary to renew each year because of soil action or some other undetermined cause, have not been disturbed.

In an eastern Canadian city, subject to extremely low temperatures during the winter season, not a single service has been replaced because of frost action since copper service pipe was adopted for domestic service connections about six years ago.

Our Research and Engineering Departments will consider it a privilege to co-operate with members to enable them to determine whether copper service pipe can be economically adopted in the systems under their control.

* Paper read before 25th Annual Convention Canadian Gas Association, June 9 and 10, 1932.

NOTES ON PLANT AND PROCESSES

"Hailware" Flake Bowls and Shades.

The accompanying illustrations show typical examples of a new range of shades and bowls in "Hailflake," manufactured by Messrs. Hailwood & Ackroyd, of Morley, near Leeds.

Available in a number of attractive designs, these fittings are being supplied, in addition to white, in colours of rose, green, light gold, deep gold, and also variegated colours.

Silica and Firebricks.

A new publication by Messrs. John G. Stein & Co., Ltd., Silica and Firebrick Manufacturers, of Bonnybridge, Scotland, is definitely something more than a mere catalogue of products; it is rather a text book on silica and firebricks from the mining and selection of the raw material through all the subsequent stages of manufacture to the finished and tested product.

The business of the firm was established by the late Mr. John G. Stein in 1887, starting at Bonnybridge Works with an output of thirty thousand bricks weekly. The Company now have an output of a million refractory bricks weekly and are claimed to be the largest makers in the British Empire. This expansion, as is made clear in the present publication, has resulted from the policy of striving always to improve the quality of their products. This policy remains the same to-day, and with the improved facilities for scientific research and control available inside the organization, which are described in detail in the brochure, they hope to deserve and to see a continuation of this expansion in the future.

As an appropriate opening to this 136-page production a number of excellent photographs show views of the works of the Company and various phases in the manufacture of the different kinds of refractory materials. Possession of abundant sources of fireclays, covering a wide range of properties, enables the firm to select those best suited for the particular purpose in view. The valuable properties of each clay have been established by careful research work and are fully brought out in the process of manufacture.

The brochure first shows how every factor having an influence on the properties of the brick is carefully controlled throughout the process of manufacture, which control is reflected in the uniformity of all their products. In the pages that follow certain features of each of their brands are set down, while, as a guide to users, the various applications of the different brands are given.

The many sections, each of which is fully illustrated by photographs and diagrams, include: Jointing and patching materials; volume changes of silica; expansion curves; insulation of furnaces; heat regeneration; softening points of Seger cones; melting points of ceramic materials and mixtures; a glossary of ceramic terms; together with a number of useful tables and formulæ and illustrations of fireclay special shapes for gas retorts. A final section shows illustrations of the principal types of furnaces, including well-known gas plant, while a comprehensive index and a number of blank pages for the student's notes complete a publication on the merits and production of which Messrs. John G. Stein & Co., Ltd., are to be complimented.

Flexible Steel Driving Belts.

Power transmission by steel belt was introduced about 25 years ago, and now there are upwards of 6000 main drives in successful operation in Europe.

A booklet published by the Steel Band Conveyor and Engineering Company, Ltd., of Barker Street Works, Parade, Birmingham, shows that the application of these belts is most varied. Geared turbines, steam, gas and oil engines, and large motors, and also such erratic loads as rolling and crushing mills, can all be satisfactorily handled. The ratio of the pulleys can be up to 5 or 6:1, provided the centres are sufficiently long to ensure a suitable arc of contact on the smallest pulley. Several belts can be mounted side by side on one pulley. The rims of the pulleys are always thinly faced with cork, which has a high co-efficient of friction, and the efficiency of a steel belt is stated to be extremely high, usually stated as over 99 p.ct., but actually believed to be 99·7-99·8 p.ct. It is obvious that if there were any perceptible slip the thin cork facing would be immediately torn off—but it is not.

The publication, after giving some general information regarding steel belts, goes on to give an abridged description of the method of installation and the conversion of grooved pulleys to flat rims without permanently effacing the grooves. Drives that have been installed by the firm for many and various purposes are described and illustrated in the booklet.

REGISTER OF PATENTS

Hydrogenation of High Boiling-Point Hydrocarbons.—No. 370,909.

GAS LIGHT AND COKE COMPANY and GRIFFITH, R. H., both of Westminster, S.W. 1.

No. 1051; Jan. 12, 1931.

This invention relates to processes for the destructive hydrogenation of high boiling-point hydrocarbons and derivatives thereof by treatment with hydrogen, or hydrogen-containing gases such as water gas, at an elevated temperature and pressure, with the formation of hydrocarbons having a lower boiling point than the boiling point of the hydrocarbon or derivative treated. Instances of high boiling-point hydrocarbons the treatment of which is contemplated in this invention include coal tar, natural petroleum, asphalt, bitumen, heavy oils, and oil fractions produced from these substances. The hydrocarbon derivative may be a phenolic body. A molybdenum catalyst and a promoter are used, and appropriate proportions of hydrogen sulphide.

Peaks in the catalyst activity curve occur with varying proportions of promoter also in cases where the reaction is assisted by the joint action of a molybdenum catalyst, a promoter therefor, and appropriate proportions of hydrogen sulphide. The peaks occur in the same positions in the curve.

The process is characterized by the selection and use of a peak-ratio of promoter to catalyst; that is to say, a ratio of promoter to catalyst which is within the peak or one of the peaks of the catalyst-activity curve.

The free hydrogen sulphide should be present in the critical proportions, relatively to the quantity of initial material treated, which ensure the highest yield. The hydrogen sulphide may either be introduced as such into the reaction sphere, or it may be formed *in situ* therein. In the latter case, elemental sulphur may be introduced into the reaction sphere to combine with the hydrogen therein, or conveniently carbon bisulphide may be mixed with the tar or other initial material to be treated; or again the requisite quantity of sulphur may be derived from the initial material itself. In some cases the initial material may be found to be too rich in available sulphur, in which event the said material may be blended with other initial material less rich in sulphur or sulphur-free.

The molybdenum catalyst may either consist of molybdenum in the elemental form, or of an appropriate molybdenum compound—for example, molybdic acid.

Similarly, the promoter may either be in the elemental form, or in the form of a suitable compound—for example, an oxygen compound of a sulphide of the element. Various promoter elements have been found to give satisfactory results in the process. Silicon, boron, and phosphorus appear to be the most satisfactory.

Gas Companies' Results

Berwick.

Presiding at the Annual Meeting of the Berwick and Tweedmouth Gaslight Company, held at Berwick, Mr. R. P. Lee, Chairman, said the year had been a difficult one, but the Company was able by drawing a small sum from reserve to pay a dividend of 5 p.ct., free of income-tax. There had been a little fall in the revenue, partly owing to the mildness of the winter months and partly owing to the advance in income-tax, which amounted to £400 more than in previous years. Seconding the adoption of the report, Mr. J. W. Carmichael said that taking everything into consideration, the position was quite satisfactory, and the shareholders would be quite satisfied if the Directors continued to pay 5 p.ct. On the motion of Mr. Cowen, it was decided to award the Directors 100 guineas in acknowledgment of their services. In seconding this, Mr. J. W. Carmichael suggested that the Directors might give more consideration to advertising the uses of gas. He noticed that in one place not far from Berwick steps had been taken recently for demonstrations of the uses of gas to be given to the public. The Chairman said the Directors would possibly consider the question of advertising.

Cupar.

The report of the Cupar Gas Company showed a profit of £2002. It was agreed to declare a dividend of 5 p.ct., free of tax, on the preference stock, and 8¾ p.ct., free of tax, on the ordinary stock, carrying forward £400 for depreciation and the balance of £308 to next year's account. The quantity of gas sold exceeded the previous year's output by over 1 million c.ft.

Hawick.

At the annual meeting of Hawick Gas Company it was reported that the profits for the year amounted to £3211. A dividend of 5 p.ct., free of income-tax, was adopted, and it was decided that the price be reduced by 4d., thus making it 3s. 8d. per 1000 c.ft.

Morpeth.

The gross profit for the year of the Morpeth Gas Light Company (1902), Ltd., amounts to £3000, which, with £1532 brought forward from last year, gives a total of £4532 available. The Directors recommend that this be dealt with as follows: In writing off for depreciation on meters and cookers, £520; in placing to reserve for special renewals of plant, &c., £250; in placing to general reserve account, £100; income-tax, £551; in paying 6 p.ct. for the year on preference shares, less income-tax (of this, an interim dividend amounting to £304, being at the rate of 3 p.ct., less tax, was paid in February last); in paying 7 p.ct., free of tax, for the year on ordinary shares (of this, an interim dividend amounting to £423, being at the rate of 2½ p.ct., free of tax, was paid in February last); and in carrying forward the balance of undivided profits of £1303. The works and plant have been well maintained, £2150 having been spent in repairs and renewals during the year. There has been a small increase in the make and sales of gas during the year, but owing to the extremely mild winter this has not kept pace with the increase in the number of customers. The slight decrease in the profits is due to the fall in the price of residuals, the market for coke being notably poor. The cost of the installation of the new system of public lighting has been considerable, but the Directors feel that this is fully justified by the great improvement in the lighting of the town.

Northampton.

A successful year's trading and an increase in gas sales, in spite of continued trade depression and an exceptionally mild winter, were reported at the annual meeting of the Northampton Gaslight Company—the Chairman of Directors (Mr. F. Bostock) presiding. The report of the Directors for the year ended June 30 stated that an interim half-year's dividend at the rate of 5 p.ct. per annum amounting to £9978 was paid in February, and after payment of interest on debentures there remained an available balance of £47,722. The Directors recommended the payment of a dividend for the past half-year on consolidated stock at the same rate as before—5 p.ct. per annum (subject to income-tax). This would absorb the sum of £9978, leaving a balance of £37,743 to be carried forward to next year's account. Proposing the adoption of the report and accounts, the Chairman drew attention to the fact that in spite of the difficulties encountered during the year, the Company were able to carry forward a sum slightly larger than that brought forward last year. "You will see in the Directors' report," he continued, "that notice has been given to the holders of the 6 p.ct. and 7 p.ct. redeemable debenture stocks of the Company of the Company's intention to redeem these stocks on Jan. 1, 1933. For the purpose of this redemption £96,900 5 p.ct. redeemable debenture stock, 1932, has been issued. The 1932 debenture stock gives the Company the right to redeem at par on Jan. 1 or July 1 in any year after July 1, 1952, subject to six calendar months' previous notice."

Mass Production of
STANTON
Standard "Special" Castings
BIG PRICE REDUCTIONS

IMMEDIATE DELIVERY FROM STOCK
The Stanton Ironworks Company Limited Nr. Nottingham

Corporation Undertakings' Results

Edinburgh.

Revenue reached £646,000, as against £613,000 estimated, there being a slight increase in gas consumption, and an excess yield of £28,000 in respect of residuals. The year finished with a surplus, after transferring £12,000 to general reserve, of approximately £4000, and the reserve now stood at nearly £90,000. It is a significant fact and a tribute to the efficiency of the undertaking that year by year more gas is produced with gradually reducing costs all over, and the City Treasurer was glad to be able to record the fact. Gas was no spent force, and he foresaw many years of successful development of the undertaking under the careful management of the Public Utilities Committee. It was satisfactory to record progress in all their trading undertakings—pre-war prices for all their commodities, comfortable reserves, and a steadily reducing debt. Such a record must be hard to beat, but they would go better yet. Things were so difficult that it would be doubtful policy at the moment to reduce charges for gas and electricity, but he was sure the Committee concerned would watch the position closely. Might he express the hope that a continuance of present consumption and costs would at no distant date render possible further reductions.

Hereford.

In presenting the annual report and statement of accounts of the Hereford Gas Undertaking for the past year to a meeting of the City Council, the Chairman (Alderman Witts) said that last year's loss of £730 had been turned into a profit of £351. The gross profit on the undertaking last year was £9793, against £8464 the previous year. He mentioned that the installation of vertical retorts had been fully justified, inasmuch as there had been a reduction in the gas-making costs of no less than 1s. per 1000 c.ft. The Chairman also mentioned that the Committee had adopted certain suggestions which were made by Mr. W. A. Valon, who last year was appointed to examine the undertaking and report. His report stated that in his opinion the undertaking was efficiently conducted in accordance with modern practice. In reply to a suggestion that some of the profits might go to the consumer, Alderman Witts said the Committee had reduced the price of gas since the retorts were installed by 9d. per 1000 c.ft., which cost them £8000. Every penny by which the price of gas was reduced cost them £1000, and with a profit of only £350 they could not reduce the price of gas at a cost of £3000 a year. When they had sufficient profit the price would then be reduced.

Lancaster.

The receipts of the Gas Department for the year were £83,522, and the expenditure £63,024. Coal carbonized during the year amounted to 24,581 tons, costing £25,088, an average of 20s. 4·95d. per ton, against 20s. 6·36d. per ton last year. The gas manufactured was 414,015,000 c.ft., an increase of 13,390,000 c.ft., or 3·34 p.ct. The average yield of gas per ton of coal carbonized was 16,842 c.ft. of a declared calorific value of 475 B.Th.U. per c.ft., equal to 80 therms per ton of coal. Gas sales totalled 390,881,000 c.ft. The net income from gas sales was £58,259, equal to an average of 35·77d. per 1000 c.ft. of gas sold, including public lamps. Coke, tar, and ammonia products realized £12,380, equal to 10s. 0·83d. per ton of coal carbonized, or 49·3 p.ct. the cost of coal, bringing the net cost of coal to 10s. 4·07d. per ton. The capital account shows the amount borrowed up to March, 1932, was £219,530. Of this £89,559 has been redeemed.

Middlesbrough.

The total capital outlay on the gas undertaking to March 31, 1932, amounted to £805,534, an increase of £13,177 during the last financial year. In respect of the gross capital expenditure during the year of £13,177, a sum of £8367 has been met by borrowing, and a sum of £4809 has been provided by contributions from the net revenue account. The debt outstanding at March 31, 1932, amounted to £233,164, against a sum of £257,196 at March 31, 1931—a decrease during the year of £24,031. The gross profit amounted to £45,544, against a sum of £38,019 for the previous year—an increase of £7524 for the year. The income from the sale of gas amounted to £123,873, against a sum of £124,535 for the previous year, or a reduction of £661. Hire purchase and miscellaneous receipts, on the other hand, increased by £1883 from £12,624 to £14,507, giving an increase of £1221 in the total revenue of the Undertaking. The expenditure for the year amounted to £92,836, against £99,139 for the previous year—or a decrease of £6303. The balance of net revenue account brought forward from the previous year was £3043, and the sum transferred from revenue during the year amounts to £45,544. There is also a sum of £329, being the interest and redemption receivable in respect of public lighting. The total credit to this account is, therefore, £48,917. Against the account have been debited interest and redemption amounting to £26,985, while a further sum of £4809 has been transferred to capital account in aid of capital expenditure during the year. This leaves a balance of £17,121, which has been transferred to the sinking fund for the redemption of debt.

(For further Corporation Undertakings' Results see p. 306.)

The Model Coin Collector

Reduced Prices

Painted and lettered as required

TELEPHONES
Manchester 2289
Collyhurst
Nottingham 75202
Watford 2645

TELEGRAMS
Sawer, Manchester
Sawer, Nottingham
2645, Watford

THE ORIGINAL and STILL THE BEST
Sole Makers:—
SAWER & PURVES
(Branch of Meters Ltd.)

NELSON METER WORKS MANCHESTER
14, DERBY ROAD WATFORD
RADFORD METER WORKS NOTTINGHAM

GAS MARKETS & MANUFACTURES

Stock Market Report.

[For Stock and Share List, see later page.]

The long account closed on Friday last with a cheerful tone despite the weakness of sterling. British Funds were a trifle down, which was due mainly to a diversion of interest to the more speculative departments brought about by the rally on Wall Street, and it is anticipated that the new account will be much more active than is usual during August. The City is anxiously awaiting the Treasury's official figures with regard to the amount of War Loan converted and also for the lifting of the embargo on new issues, for the present position is proving a severe handicap to many industrial undertakings needing fresh capital for development.

Business in Gas Stocks and Shares continued normal for the time of year, and prices generally were maintained. Alliance and Dublin ordinary dropped 5 points to 100-110, which was due doubtless to the present political situation. Other changes of note were 5 points in East Surrey ordinary and 4 points in the 5 p.ct. debenture to 110-120 and 114-119 respectively, and 5½ points, to 120-130 *ex* dividend, in Derby consolidated and 12½ points, to 75-85, in the 4 p.ct. debenture.

Doubtless many holders of gas stocks have been considering the possible future values of their holdings; for while to some extent conditions have been artificial and the abnormal increases in many sections brought about by the readjustment of values generally, there is a firm belief that the present cheap monetary conditions will continue for a long time to come. In this event, therefore, though there may be some falling off in values in the more speculative markets, the steady income earning capacity of gas securities may tend to maintain prices for the most part in the region of their present levels.

Current Sales of Gas Products.

The London Market for Tar Products.

LONDON, *Aug.* 8.

There is no change to report in the prices of tar products, which remain the same as on the 2nd inst.

Tar and Tar Products in the Provinces.

Aug. 8.

The average prices of gas-works products during the week were: Gas-works tar, 34s. 6d. to 39s. 6d. Pitch—East Coast, 85s. f.o.b. West Coast—Manchester, Liverpool, Clyde, 85s. f.o.b.* Toluole, naked, North, 1s. 7½d. to 1s. 9d. Coal-tar crude naphtha, in bulk, North, 5d. to 5½d. Solvent naphtha, naked, North, 1s. 2½d. to 1s. 3d. Heavy naphtha, North, 10½d. to 11d. Creosote, *ex* works, in bulk, North, liquid and salty, 2½d. to 3d.; low gravity, 1¼d., Scotland, 2½d. to 3d. Heavy oils, in bulk, North, 4¾d. to 5½d. Carbolic acid, 60's, 1s. 7d. to 1s. 7½d. Naphthalene, £9 to £10. Salts, 55s. to 75s., bags included. Anthracene, "A" quality, 2½d. per minimum 40 p.ct., purely nominal; "B" quality, unsaleable.

* All prices for pitch are now quoted on the basis of f.o.b. In order to arrive at the f.a.s. value at any port it will be necessary to deduct the loading costs and the tolls whatever they may be.

Tar Products in Scotland.

GLASGOW, *Aug.* 6.

No change in market conditions in this district can be recorded. Quotations are fairly steady, but new business is difficult to secure.

Crude gas-works tar.—Actual value is now 55s. to 60s. per ton *ex* works.

Pitch continues firm with forward demand very active. Values are steady at 85s. to 90s. per ton f.o.b. Glasgow for export, and 90s. to 95s. per ton *ex* works in bulk for home trade.

Refined tar to Ministry of Transport Specification is only in moderate call at 4½d. to 4¾d. per gallon *ex* works naked.

Creosote oil.—Stocks are comparatively low and quotations are steady. B.E.S.A. Specification is 3½d. to 3¾d. per gallon; low gravity, 3⅜d. to 4d. per gallon; and neutral oil, 3¾d. to 4d. per gallon; all *ex* works in bulk.

Cresylic acid.—This remains a dull market. Pale, 97/99 p.ct., is 1s. 0½d. to 1s. 1½d. per gallon; dark, 97/99 p.ct., 11½d. to 1s. 0½d. per gallon; and pale, 99/100 p.ct., 1s. 2½d. to 1s. 3½d. per gallon; all *ex* makers' works.

Crude naphtha.—Value is unchanged at 4½d. to 5d. per gallon, according to quality.

Solvent naphtha.—90/160 grade is 1s. 2d. to 1s. 3d. per gallon, and 90/190 grade is 11d. to 1s. per gallon.

Motor benzole is only maintained at 1s. 2½d. to 1s. 3½d. per gallon in bulk quantities *ex* works, owing to short production.

Pyridines.—90/160 grade is 3s. to 3s. 3d. per gallon, and 90/140 grade 3s. 3d. to 3s. 6d. per gallon.

Benzole Prices.

These are considered to be the market prices for benzole at the present time.

	s. d.		s. d.	
Crude benzole	0 8½	to	0 9	per gallon at works
Motor "	1 3½	"	1 4	" " "
Pure "	1 7	"	1 8	" " "

Contracts Advertised To-Day.

Coal.

The Gas Committee of the Marple Urban District Council invite tenders for the supply of coal. [Advert. on Supplement p XII.]

Trade Notes.

"A Word of Wisdom."

A booklet bearing this title has been prepared by the Technical Expert to Messrs. Thomas Duxbury & Co., Palace Chambers, Westminster, S.W. 1, in order to help users of "Lux" gas purifying material to obtain the best results. The booklet, which is excellently produced, should be of much practical assistance.

Corporation Undertakings' Results.

(*Continued from p. 305.*)

Lurgan.

The Auditor's report on the municipal gas-works at Lurgan disclosed a net loss of £604 for the year 1931-32, as compared with a net gain of £1040 for the previous year. This loss was mainly due to an increased sum of £500 paid for putting in new cooking stoves, and £800 decrease due to reduction of the price of gas. There was a credit balance at the end of March, 1932, of £1494, and the necessity of charging the loss on the rates is avoided.

Warrington.

The Warrington Gas Department has had a successful year's working, and in the annual report of Mr. A. Cook, the Engineer and Manager, it is mentioned that the gas consumed was 657,576,800 c.ft., as against 632,587,800 c.ft. in 1930-31. The consumers numbered 6831 by ordinary meters and 17,617 by slot meters. The number of collections from slot meters averaged 6·83, as against 6·46 in the previous year. The working expenses were £2782 more than in 1930-31, the main increases being: Maintenance of works and plant, £2593, and maintenance of meters, £538. The profit of £1077 has been carried forward to the appropriation account, bringing the credit balance of the account to £60,146. Since the acquisition of the undertaking, debt to the extent of £258,759 has been extinguished, and the reserve fund now amounts to £9449. A feature of the year's returns is the steady increase in the usage of apparatus, the number having been doubled since 1926. The total in use on March 31, 1932, was 27,957, and the total on March 31, 1926, was 13,700. The building of the new showrooms is being proceeded with as rapidly as possible, and it is anticipated that they will be in use in about twelve months' time.

West Bromwich.

The Gas Committee of the West Bromwich Town Council report that the accounts for the year ended March 31, 1932, show that the total income for the year was £110,236, as compared with £111,507 the previous year—a decrease of £1270. The gross profit amounted to £16,370, and after the payment of interest and sinking fund charges and allowances for income-tax, amounting together to £9980, there was a net profit of £6390, as compared with a net profit of £4920 the previous year. The net revenue appropriation account showed a balance in hand of £6951.

STOCK AND SHARE LIST.

Official Quotations on the London and Provincial Stock Exchanges.

[For Stock Market Report, see earlier pages.]

Issue	Share.	When ex-Dividend.	Dividends. Prev. Hf. Yr.	Dividends. Last Hf. Yr.	NAME.	Quotations. Aug 5.	Rise or Fall on Week.	Transactions. Lowest and Highest Prices During the Week.
£			% p.a.	% p.a.				
1,551,868	Stk.	Apl. 4	7⅛	7⅛	Alliance & Dublin Ord. ...	100—110	−5	...
374,000	,,	July 4	4	4	Do. 4 p.c. Deb. ...	75—80	...	...
557,655	,,	Mar. 14	7	7	Barnet Ord. 7 p.c.	135—145	...	...
300,000	1	Apl. 29	1/4⅛	1/9⅛	Bombay, Ltd.	15/—20/-	...	...
177,750	Stk.	Feb. 29	9	9	Bournemouth sliding scale	180—190	...	...
550,050	,,	,,	7	7	Do. 7 p.c. max. ...	137—147	...	...
439,160	,,	,,	6	6	Do. 6 p.c. Pref. ...	130—135	...	...
50,000	,,	June 20	3	3	Do. 3 p.c. Deb. ...	70—75	...	...
162,025	,,	,,	4	4	Do. 4 p.c. Deb. ...	90—95	...	93—95
210,000	,,	,,	5	5	Do. 5 p.c. Deb. ...	115—120	...	118—119
357,900	,,	Mar. 14	7½	7½	Brighton, Hove, & Worthing 6 p.c. Con. ...	135—145	...	143—144
540,000	,,	,,	6⅔	6⅔	Do. 5 p.c. Con. ...	120—130	...	...
195,500	,,	,,	6	6	Do. 6 p.c. B Pref.	129—134	+1	...
1,287,500	,,	Feb. 29	5	5	Bristol 5 p.c. max.	109—111[a]	...	...
120,420	,,	June 20	4	4	Do. 1st 4 p.c. Deb. ...	90—94[a]	...	...
217,870	,,	,,	4	4	Do. 2nd 4 p.c. Deb. ...	90—94[a]	...	...
328,790	,,	,,	5	5	Do. 5 p.c. Deb.	115—120[a]	...	...
855,000	,,	Apl. 4	7	8	British Ord.	132—142	...	137—138
100,000	,,	June 20	7	7	Do. 7 p.c. Pref.	120—130	...	...
120,000	,,	,,	4	4	Do. 4 p.c. Red. Deb. ...	87—92	...	...
450,000	,,	,,	5	5	Do. 5 p.c. Red. Deb. ...	105—115	...	...
160,000	,,	July 4	5	5	Cambridge 5 p.c. Deb. ...	114—119	...	...
100,000	10	May 23	6	6	Cape Town, Ltd.	7⅞—8⅛	...	...
100,000	10	Apl. 29	4½	4½	Do. 4½ p.c. Pref. ...	6—7	...	...
150,000	Stk.	June 20	4½	4½	Do. 4½ p.c. Deb. ...	80—90	...	87—89½
626,860	,,	Feb. 15	6	6	Cardiff Con. Ord.	100—105	...	...
237,860	,,	July 4	2½	5	Do. 5 p.c. Red. Deb.	105—110	...	...
167,150	,,	Feb. 15	5	6½	Chester 5 p.c. Ord.	89—94[b]	...	...
98,936	1	May 23	2/-	2/-	Colombo, Ltd. Ord.... ...	26/—31/-	...	...
24,500	1	,,	1/4⅛	1/4⅛	Do. ¶ p.c. Pref.	17/—19/-	...	...
609,204	1	Apl. 4	-/10'90	-/11'47	Colonial Gas Assn. Ltd. Ord.	10/—15/-	...	...
296,058	1	,,	1/2'54	1/3'30	Do. 8 p.c. Pref.	10/—15/-	...	...
3,073,280	Stk.	Feb. 15	6	5½	Commercial Ord.	100—110	...	108
475,000	,,	June 20	3	3	Do. 3 p.c. Deb. ...	70—75	...	...
807,560	,,	Feb. 15	7	7	Croydon sliding scale	132—142	...	137
469,590	,,	,,	5	5	Do. max. div.	95—100	...	...
500,000	,,	July 4	5	5	Do. 5 p.c. Deb.	115—120	...	119½—119¾
542,270	,,	Aug. 8	7	10	Derby Con.	120—130[c]	+5½	...
55,000	,,	July 4	4	4	Do. 4 p.c. Deb.	75—85[c]	+12½	...
209,000	,,	Mar. 14	5	5	East Hull Ord. 5 p.c. ...	94—99	...	...
179,500	,,	Feb. 29	5⅔	5⅔	East Surrey Ord. 5 p.c. ...	110—120	+5	...
155,019	,,	June 20	5	5	Do. 5 p.c. Deb. ...	114—119	+4	...
1,002,180	,,	Mar. 14	†4	†6⅔	European, Ltd.	95—105	...	101—103
19,405,992	,,	Feb. 15	5⅔	5⅔	Gas Light & Coke 4 p.c. Ord.	23/—25/-/-	...	23/3—24/-
2,600,000	,,	,,	3⅔	3⅔	Do. 3½ p.c. max.... ...	81—86	+1	83—85
4,477,106	,,	,,	4	4	Do. 4 p.c. Con. Pref. ...	96—101	...	99⅝—100½
6,102,497	,,	June 20	3	3	Do. 3 p.c. Con. Deb. ...	75—80	...	78—79
3,642,770	,,	,,	5	5	Do. 5 p.c. Red. Deb. ...	109—114	...	111—111⅔
2,500,000	,,	,,	4½	4½	Do. 4½ p.c. Red. Deb. ...	105—110	...	106½—107¼
264,011	,,	—	—	—	Harrogate New Cons. ...	106—111	...	...
82,500	,,	Mar. 14	7	7	Hastings & St. L. 5 p.c. Conv.	120—130	...	125
258,740	,,	,,	5⅔	5⅔	Do. 3½ p.c. Conv.	90—95	...	...
70,000	10	June 6	‡5	‡10	Hongkong & China, Ltd. ...	10—11	...	...
213,200	Stk.	Feb. 29	6	6	Hornsey Con. 3½ p.c. ...	105—110	...	...
5,600,000	,,	June 6	15	14	Imperial Continental Cap.	180—200	...	186—190
223,130	,,	Feb. 1	3½	3½	Do. 3½ p.c. Red. Deb.	82—87	...	84—86
235,242	,,	Mar. 14	8⅓	8⅓	Lea Bridge 5 p.c. Ord. ...	145—155	...	...
2,145,907	,,	Feb. 29	6	6	Liverpool 5 p.c. Ord. ...	112—114[b]	...	...
245,500	,,	June 20	5	5	Do. 5 p.c. Red. Pref. ...	100—110[b]	...	...
306,083	,,	July 15	4	4	Do. 4 p.c. Deb. ...	85½—90½[b]	...	...
165,736	,,	Feb. 15	8	10	Maidstone 5 p.c. Cap. ...	155—165	...	160½
56,176	,,	June 20	3	3	Do. 3 p.c. Deb. ...	65—70	...	...
75,000	5	June 20	‡10	‡10	Malta & Mediterranean ...	7⅞—8⅞	...	...
892,000	—	Apl. 1	5⅓	5⅓	Metropolitan (of Melbourne) 5½ p.c. Red. Deb.	95—100	...	...
171,978	Stk.	Feb. 29	5	5	M. S. D. Utility "C." Cons.	88—93	...	...
718,657	,,	,,	4	4	Do. 4 p.c. Cons. Pref.	82—87	...	...
112,126	,,	July 4	4	4	Do. 4 p.c. Deb. ...	87—92	...	...
148,955	,,	,,	5	5	Do. 5 p.c. Deb. ...	105—110	...	...
675,000	,,	21 May '31	‡6	‡6	Montevideo, Ltd.	40—60	...	...
2,061,315	,,	Feb. 29	5	5⅔	Newcastle & Gateshead Con.	20/9—21/9[d]/	—/6	...
682,856	,,	,,	4	4	Do. 4 p.c. Pref. ...	91—92[d]	...	...
691,705	,,	June 20	3½	3½	Do. 3½ p.c. Deb. ...	89—91[d]	...	...
277,285	,,	Apl. 29	5	5	Do. 5 p.c. Deb. '43...	105—110[d]	...	...
274,000	,,	Feb. 15	5	5	Newport (Mon.) 5 p.c. max.	87—89[a]	...	...
199,940	,,	Mar. 14	7½	7½	North Middlesex 6 p.c. Con.	135—145	...	...
396,160	,,	Feb. 15	5	5	Northampton 5 p.c. max. ...	90—100	...	...
300,000	,,	Apl. 18	9	7	Oriental, Ltd.	85—95	...	...
205,162	,,	June 20	8	8	Plym'th & Stonehouse 5 p.c.	140—150	...	150
504,416	,,	Feb. 15	8	8	Portsm'th Con.Stk. 4 p.c.Std.	140—150	...	...
241,446	,,	,,	5	5	Do. 5 p.c. max. ...	90—95	...	...
114,000	,,	Feb. 15	5	5	Preston 5 p.c. Pref.	102—107	...	...
686,312	,,	July 18	4	4	Primitiva 4 p.c. Rd. Db. 1911	75—80[e]	...	...
389,813	,,	June 20	4	4	Do. 4 p.c. Cons. Deb.	76—81	...	...
150,000	10	Apl. 4	6	6	San Paulo 6 p.c. Pref. ...	7—7½	...	...
1,786,968	Stk.	Apl. 4	6	6	Sheffield Cons.	108—112[e]	...	...
95,000	,,	July 18	4	4	Do. 4 p.c. Deb.	90—94[e]	...	...
133,201	,,	Feb. 29	8⅓	5	Shrewsbury 5 p.c. Ord. ...	110—115	...	...
90,000	10	June 6	‡5	‡5	South African	4—6	...	...
6,709,895	Stk.	Feb. 15	5	7	South Met. Ord.	119—122	...	118½—120
1,135,812	,,	,,	6	6	Do. 6 p.c. Irred. Pf.	125—135	...	...
1,895,446	,,	July 4	3	3	Do. 3 p.c. Deb. ...	75—80	...	77½
1,000,000	,,	July 18	4	5	Do. 5 p.c. Red. Deb.	108—113[a]	...	...
91,500	,,	Feb. 29	8⅓	8⅓	South Shields Con.	129—131[d]	...	...
1,543,795	,,	Feb. 15	6⅔	6	South Suburban Ord. 5 p.c.	116—121	...	118
300,000	,,	,,	5	5	Do. 5 p.c. Pref.	109—114	...	...
668,837	,,	June 20	5	5	Do. 5 p.c. Deb.	116—121	...	119—120
647,740	,,	Feb. 29	5	5	Southampt'n Ord. 5 p.c. max.	95—100	...	...
121,275	,,	June 20	4	4	Do. 4 p.c. Deb.	90—95	...	...
200,000	,,	June 20	6⅓	6⅓	Swansea 6⅓ p.c. Red. Deb.	105—110	...	107—108
1,076,490	,,	Feb. 29	6⅔	6⅔	Tottenham and District Ord.	128—133	+1	132
300,000	,,	,,	5⅓	5⅓	Do. 5⅓ p.c. Pref. ...	115—120	..	116
199,005	,,	June 20	4	4	Do. 4 p.c. Deb. ...	91—96	+1	93
85,701	,,	Apl. 4	6	6	Tuscan, Ltd., 6 p.c. Red. Db.	70—75	...	...
346,069	,,	Feb. 29	7	7	Uxbridge, Maidenhead, & Wycombe 5 p.c.	128—133	...	...
88,330	,,	,,	5	5	Do. 5 p.c. Pref. ...	100—105	...	...
1,322,220	,,	July 4	7	7	Wandsworth Consolidated	135—140	...	138
971,373	,,	,,	5	5	Do. 5 p.c. Pref.	109—114	...	...
1,167,964	,,	June 20	5	5	Do. 5 p.c. Deb.	115—120	+2½	117½—118¾
158,400	,,	Feb. 29	5	6g	Winchester W.&G.5p.c.Con.	100—105	...	...

Quotations at:—*a.*—Bristol. *b.*—Liverpool. *c.*—Nottingham. *d.*—Newcastle. *e.*—Sheffield. *f.*—The quotation is per £1 of stock. *g* Paid £3, including 10s. on account of back dividends. * Ex. div. † Paid free of income-tax. ‡ For year.

(This announcement is inserted gratuitously.)

PETER—WITH ONE EXCEPTION

With one exception Peter is an ordinary little fellow. Chubby, likeable, just five-and-a-half, full of life and fun and on occasions—be it admitted—of naughtiness.

Just now Peter's rather important, for this is his first term at school, and he's grappling with the intricacies of "A B C" and "Twice Two": difficult subjects to all men of five-and-a-half, but even more difficult in Peter's case because—bad luck—he's totally blind. That's his One Exception.

Peter learns reading, writing, and 'rithmetic through the medium of "Braille"—dull stuff compared with the coloured picture books of most five-and-a-halfs. However, he's a stout lad is Peter, and he's making great progress.

Would you like to know more about him? How, in spite of his "One Exception," he is being educated, and, when older, technically trained and usefully employed.

There is a long waiting list of "Peters" throughout the British Isles, for whom training and accommodation must be provided in the immediate future.

Will you help with a donation or annual subscription? Any sum, large or small, will be gratefully received.

Here's a suggestion. Your eyesight is worth 3d. a year to you. Send Peter and his handicapped pals 3d. for every year you've had it. Now, please, in case it slips your memory. Good idea!

THE CHAIRMAN,

SCHOOL FOR THE BLIND

(Founded 1838),

Swiss Cottage, LONDON, N.W.3

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